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Computers in Business: Section III

NEWS SUMMARY

GENERAL

U.S. steps up arms supplies to Thais

The U.S. is stepping up arms supplies to Thailand after the latest Vietnamese offensive against Kampuchean guerrillas. Fighting spread across Thailand's border.

Extended range howitzers and ammunition are due to arrive today. A weekend consignment included surface-to-air missiles, part of Thailand's $200m arms purchases through the U.S. foreign military sales programme.

President Reagan has now asked Congress to approve an additional $25m. **Page 2**

Training base claim

The U.S. plans to establish a military base in Honduras to train Salvadorean soldiers, according to two top Reagan Administration officials quoted by the New York Times.

$1.7bn weapon plan

The Pentagon is to go ahead with the $1.7bn Copperhead laser-guided anti-tank weapon in spite of an official report showing it copes poorly with battlefield problems.

Data protection move

The UK Data Protection Bill starts its second reading in the House of Commons today when the Opposition will try to broaden its scope. **Page 16; Editorial comment, Page 14**

Gulf oil slick bid

Kuwait's Health Minister Abdel-Rahman al-Awadi started a crisis shuttle to warring neighbours Iran and Iraq to stop a Gulf oil spillage from damaged Iranian wells.

Malta bar

Malta refused entry to Sam McCluskie, UK Labour Party chairman and National Union of Seamen assistant general secretary. It was believed to be over the union's position in a Maltese strike some years ago.

Afghanistan initiative

Indirect talks aimed at ending the conflict in Afghanistan are to start today under the auspices of the United Nations. **Page 2**

Lead level studies

Atmospheric lead levels have no statistically significant effect on city childrens's intelligence, according to UK studies. **Page 6**

Rumasa files found

Police hunting a kidnap victim in Madrid found files of the Rumasa group that were reported missing after the Government took over the company in February.

Marseilles chase

A Polish gunman who fired at an office of the Soviet airline Aeroflot was arrested after a car chase through Marseilles.

Dressing down

Soviet youths were "desecrating" their country by wearing T-shirts labelled "U.S. Marine Corps" and "Britannia rules the waves," said the army newspaper Krasnaya Zvezda (Red Star).

Amin plans return

Former Ugandan dictator Idi Amin said he plans to return to the country to lead underground opposition groups.

Briefly . . .

Storm killed three people and injured 40 in Dhaka, Bangladesh.

Northern Ireland bomb destroyed a garage in Omagh, the second bombing in the town in 24 hours.

Eritrean Popular Liberation Front said it killed 2,557 Ethiopian troops in recent fighting.

BUSINESS

$175m plan for Italian smelters

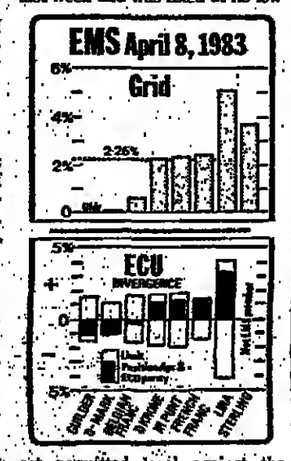
ITALIAN Government allocated L250bn ($175m) to restructure the troubled aluminium industry but gave no indication whether the plan includes the hoped- for participation by Switzerland's Alusuisse. **Page 2**

● **BRITISH RAIL** policy change will lead to the private sector supplying major equipment for the first time in 20 years. **Page 7**

● **MORE JOB CUTS** in the UK industrial and service sectors until the end of the decade are forecast in a National Economic Development Council memorandum. **Page 16**

● **ROLLS-ROYCE** U.S. car prices are to be cut by between $14,000 and $18,000 – the equivalent of about three Honda Civics. **Page 16**

● **DUTCH GUILDER** lost ground in the European Monetary System last week and was fixed at its lowest permitted level against the French franc. This prompted central bank intervention to support the guilder while Dutch interest rates showed a firmer trend. The D-Mark was weak, touching its lower limit against the French franc and Danish Krone. The Belgian franc was around the middle of the system, allowing further small cuts in some domestic rates. The French franc's strength reflected renewed confidence following the French Government's latest austerity package.



The chart shows the two constraints on European Monetary System exchange rates. The upper grid, based on the weakest currency in the system, defines the cross rates from which no currency (except the lira) may move more than 2¼ per cent. The lower chart gives each currency's divergence from its "central rate" against the European Currency Unit (ECU), itself a basket of European currencies.

● **CHEUNG KONG** Holdings, a Hong Kong property company, is buying out its partner in an industrial site to save HK$80m ($13.4m). **Page 18**

● **DEVELOPMENT AID** totalling more than £100m ($151m) is planned by the UK for industry in India. **Page 5**

● **LAIRD GROUP**, UK transport and engineering concern, raised taxable profits by £2.62m to £19.1m ($28.9m) last year. **Page 19**

● **BERLINER** Handels- und Frankfurter Bank, West Germany's biggest merchant bank, reported a sharp recovery in 1982 operating profits. **Page 18**

● **LLOYD'S** committee is opposing new rules for overhauling inadequate accounting standards in the London insurance market. **Page 16**

● **CHINA** will offer longer tax holidays and greater selling opportunities to encourage more foreign investors to set up joint ventures. **Page 5**

● **APPLE COMPUTER** of the U.S. hired Pepsi-Cola Company president John Sculley as president and chief executive officer. **Men and Matters, Page 14**

Communists to press Mauroy over austerity

BY PAUL BETTS IN PARIS

THE GROWING controversy in the French Left over the Government's austerity programme will again be in evidence today when the Government asks the National Assembly to empower it to rush through the main components of its tough economic package by decree law.

The Communist Party has already warned it will vote against the Government if M Pierre Mauroy, the Prime Minister, refuses to agree to a number of amendments to some of the new economic measures. In particular, the Communists want the Government to exclude low income families from paying an additional 1 per cent annual levy to help bail out the country's social security system.

The Government's victory in the National Assembly vote today is assured by the overall Socialist Party majority in the French parliament. But M Mauroy – whose administration includes four Communist ministers – appears keen to avoid a major rift with his Communist partners in government at this delicate stage in the country's economic life.

While it is not clear how far M Mauroy is prepared to go to meet the Communist demands, the Government has managed to defuse its highly publicised row with the French travel industry, which has been in a state of uproar ever since the imposition of the new draconian travel restrictions for French tourists.

After a week of extremely vocal public protests and stormy negotiations, the Finance and Economy Ministry and the travel agents federation finally reached an agreement which eases the new foreign exchange restrictions for French tourists travelling on package holidays.

The agreement applies to all package holidays advertised before March 25 – the day the Government unveiled its austerity package and the highly controversial foreign currency travel limit of FFr 2,000 ($275) a year for French tourists.

Under the compromise, French tourists will be able to book themselves on any package holiday with meals and accommodation included and have between FFr 1,250 (for half board packages) and FFr 1,750 (for full board) deducted from their FFr 2,000 annual foreign currency allowance.

"At least the French will be allowed one trip outside the country this year," one travel agent remarked. Whether a French tourist goes to the South Pacific or to Spain, the foreign curreny deductions are the same for all package holidays.

As for the travel agents, they will be allowed to convert into foreign currency 75 per cent of funds they spent on travel packages between April and October of last year.

Although a large number of travel agents are still not satisfied, the compromise appears to have appeased the French travel industry.

For their part, the large French trade union confederations are continuing to debate their approach to the Government's austerity measure.

The pro-Communist CGT, which has made no secret of its distaste for the package, appears to be ruling out at this stage industrial action on a national scale against the measures. Instead, the CGT leadership is suggesting to its more militant members to act at a local level inside their respective enterprises and to combine local labour demands with a general protest against the Government's latest economic policies.

Jordan calls off talks with PLO

BY ROGER MATTHEWS IN RIYADH AND DAVID LENNON IN TEL AVIV

JORDAN has abandoned its efforts to reach a joint response with the Palestine Liberation Organisation to President Ronald Reagan's Middle East peace proposals.

Its decision, announced last night, deals an apparently fatal blow to the U.S. peace attempt for the region launched last September.

Earlier yesterday, a further setback to hopes of moderation within the PLO came with the assassination in Portugal of Mr Issam Sartawi, its chief advocate of dialogue with Israel. Mr Sartawi, who was representing the organisation at the congress of the Socialist International, was shot dead by a lone gunman.

Responsibility for the shooting – which occurred in the lobby of the Hotel Montechoro in Albufeira, where the conference is being held – was claimed in Damascus by a renegade Palestinian group headed by Sabri al Banna, code-named Abu Nidal.

Jordan's announcement, meanwhile, will be seen as a considerable victory for the hardline Arab states, especially Syria, which has consistently warned Arab countries and the PLO against becoming involved with the U.S. proposals.

Jordan announced after a Cabinet meeting, chaired by King Hussein, that it was taking all necessary steps to safeguard its national security and it continued to recognise the PLO as the sole representative of the Palestinian people.

The Reagan plan called for King Hussein to state his willingness to negotiate with Israel on self-determination for the 1.2m Palestinians living on the occupied West Bank and Gaza. The U.S. opposed an independent Palestinian state and proposed that self determination should only be expressed in association with Jordan.

Although King Hussein was anxious to explore the plan, he was unable to win the support of Mr Yassir Arafat, chairman of the PLO. Many Palestinians were deeply sceptical about Mr Reagan's willingness or capacity to force a major change in Israeli attitudes.

Israel rejected the Reagan plan soon after it was announced and has continued to build and develop Jewish settlements on the West Bank and Gaza in direct defiance of American wishes.

The Jordanian decision will be a setback for those Arab states closely associated with the U.S. such as Saudi Arabia. While the Saudis have not publicly urged the PLO and Jordan to respond positively to the U.S. plan, they have been making a particular effort to win over the more radical states.

Pressure is now likely to increase for an Arab summit meeting later this month, at which the member states are expected to reaffirm their own proposals – including an independent Palestinian state – which were agreed in Morocco last autumn.

Jordan made the decision known as Mr Francis Pym, the British Foreign Secretary, ended an official visit to Saudi Arabia. During his talks with King Fahd and Prince

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Congress to debate U.S. bank lending

By Anatole Kaletsky in Washington

SWEEPING REFORM of the U.S. system of regulating international lending by commercial banks will be debated by Congress this week.

A series of hearings will follow proposals prepared by the Federal Reserve Board, the Comptroller of the Currency, and the Federal Deposit Insurance Corporation, in response to congressional disquiet over the U.S. contribution to the International Monetary Fund (IMF).

Congressional acceptance of the package presented by the regulators is by no means certain, after adverse reactions over the weekend from some congressmen, who have been seeking even tougher country-by-country limits on bank lending.

However, administration officials are optimistic that in the end they will be able to hold the line against what they feel would be "inconsistent and obstructive" specific legislation, with some modification of the plan proposed by the regulators. The main elements of this are:

● Closer consideration of country risks by bank regulators and examiners. There will be three new classifications for loans to countries with debt problems. Instead of the present categories "substandard" or "doubtful," which are used to evaluate commercial risks – non-performing country loans will be declared either as a "loss," a "reservable loan" or a "debt-service impaired loan."

The loss category will be applied to loans which are clearly uncollectable, such as those that have been repudiated by a country. Loans on which interest pay-

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Study supports intervention on exchange rates

BY SAMUEL BRITTAN IN LONDON

CO-OPERATIVE intervention by leading nations, including the U.S., to smoothen out fluctuations in exchange rates is suggested by an expert group of officials set up to study the problem after last year's Western economic summit in Versailles.

The group, which was chaired by M Philippe Jurgensen, a French Finance Ministry official, does not make any formal proposals, but co-operative intervention emerges as a practical possibility from its analysis.

The Jurgensen report is to be published at the end of this month or the beginning of May in time for the oext summit, which is to be held in Williamsburg, Virginia. The report is concerned with the limited technical issue of official intervention to reduce fluctuations in exchange rates around trends which are basically determined by market forces.

The more important question of policy changes to influence that trend is put aside as outside its terms of reference.

The report thus contributes little to the appraisal of the merits of floating exchange rates compared with pegged-rate regimes of the kind prevailing in the European Monetary Systems (EMS).

Nor does the report analyse the use of the exchange rate as a possible target for domestic monetary policy.

It assumes that intervention will be "sterilised" – that is, that it will not be allowed to affect the money supply. It does not explore, however, how successful sterilisation can hope to be in the long run, oor does it assess the views of those economists who believe that non-sterilisation would be preferable.

British officials believe that the most important aspect of the report is not its precise findings, but the effect it might have in persuading the Americans to pay more attention to the international implications of monetary and fiscal policies, including the effects of the U.S. budget deficit.

British intervention in the market for sterling has been much reduced since Mrs Margaret Thatcher, the Prime Minister, returned from the Falklands earlier this year to find that interest rates had beeo raised in her absence. Since 1977 there have been oumerous switches in British official policy both on intervention and on the role of sterling's rate as a policy target.

The most important material unearthed by M Jurgensen and his colleagues is in the appendices of the report, some of which may be published later.

One opinion, by the Bank of England, coocludes that its foreign exchange interventions have on balance been profitable another special study reports the views of the major central banks on their intervention experience.

The main finding of the report, bowever, is that official intervention can be useful but that if the amounts involved are large or the exchange rate movements are very great, wider policy questions arise which cannot be settled by intervention alone.

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Inquisitive census incenses the West Germans

By James Buchan in Bonn

How can they govern us if they cannot say
That Sigrid does aerobics and Holger's gay?

Berlin Cabaret

OVER THE next two weeks, an army of 600,000 officials, policemen, jobless and local busybodies will be knocking at the doors of West Germany's 25m households to ask among some 40 other questions, whether the inhabitants are Jewish or have an outside toilet.

This might be a normal event in the life of a modern industrial state, but German officialdom has approached its first census since 1970 with the tact and sensibility of someone dealing with a large car bomb. It has devised a form that carries name, number and telephone number – this last being voluntary – and will use a mixture of threats and dubious recommendations from businessmen to bully citizens into line.

The April 27 census deadline promises to be the first test of civil disobedience for Chancellor Helmut Kohl's new Government in a year that will be marked by mass protest against the stationing of Nato nuclear missiles in Europe.

However, if the DM 370m ($152.6m) census does prove worthless, it will not be because of the mass of "alternatives," squatters, pacifists, intellectuals and so on who are planning to brave the DM 10,000 fine or even impersonate census takers on the grounds that they want no more state intervention in their lives. Nor will it be because of the 1.6m Turks who have been told by the new Government that their numbers must be cut by half over the decade.

Instead, many "ordinary citizens" resent and fear any further intrusion into their lives. The 1970 census passed with relatively few objections but since theo, mostly as a result of the battle against terrorism in the mid-1970s, the state has built up a complex computer archive, the working of which is not understood by most of the population.

Even President Karl Carstens, who signed the Census Bill into law, is understood to have deep misgivings and the Supreme Court must tomorrow decide on suits for an injunction against the census.

The questions themselves are a compromise between material designed to give a demographic pic-

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UK Data Protection Bill, Page 16

Foreign groups to bid on UK regional telephone exchange

BY GUY DE JONQUIERES IN LONDON

FOREIGN telecommunications manufacturers will have their first opportunity to compete for a share of Britain's public telephone exchange market later this year when the Hull telephone department seeks international tenders for its network modernisation programme.

The bidding is expected to pit System X, the all-electronic digital exchange developed for British Telecom, against rival products offered by several Western European and North American companies.

Hull telephone department, part of Kingston-upon-Hull city council, operates Britain's only independent public telephone system. It serves more than 100,000 subscribers in a 120-square mile area north of the River Humber.

It plans to invite tenders this summer, initially for three exchanges worth about £10m ($15m). These will be followed later by contracts worth several times as much for the rest of its modernisation programme, due to be completed by the mid-1990s.

The department was in advanced negotiations with Standard Telephones and Cables (STC), long its principal supplier, for the supply of two System X exchanges, until STC pulled out of System X product last autumn.

The company is now expected to tender System 12, the digital exchange developed by International Telephone and Telegraph (ITT) of the U.S., which owns about one third of STC. System 12 is not at present made in the UK., though STC would probably arrange to produce it at its plant in North London if it won the Hull order.

The department is also understood to have held talks with Plessey and GEC, the two System X manufacturers, which are expected to enter bids. Foreign bidders may include Canada's Northern Telecom, France's CIT Alcatel and Swedeo's L.M. Ericsson.

Hull is seeking loans from the European Investment Bank to help finance its network modernisation. The bank's rules require that contracts be put up for international tender.

System X, which has cost about £300m, to develop so far, is intended as the backbone of British Telecom's telephone network until well into the next century. GEC is also seeking to sell it to India, and talks have also been held with China and several African countries.

Like other modern digital exchanges, it is based on microelectronic circuits and is designed to be much more efficient and versatile than the electro-mechanical analogue equipment which it is due to replace.

Hull is the only independent telephone service to have survived a takeover by the Post Office earlier this century and prides itself on having scored a number of advances over its much larger rival.

It recently installed the first computerised directory inquiry system in Britain and pioneered the use of recorded music to soothe callers waiting to be connected to extensions at its headquarters. It also claims to have published the first UK telephone directory with a full-colour picture (of Humber Bridge) on its cover.

The System X battle, Page 14

CONTENTS

U.S. speeds arms deliveries to Thailand

BY KATHRYN DAVIES IN BANGKOK

THE U.S. is stepping up arms supplies to Thailand in the wake of the latest Vietnamese offensive against Kampuchean guerrillas, during which fighting spilled across Thailand's border with Kampuchea.

Two C-5 transport aircraft are due to arrive here today bringing extended-range howitzers and ammunition for the Thai army. A consignment at the weekend included Red-eye surface to air missiles, part of Thailand's $200m (£133m) worth of arms purchases through the American foreign military sales programme.

President Ronald Reagan has asked Congress to approve an additional $U.S.25m as a result of the border conflict.

Fighting in the area north of the Thai town of Aranyaprathet has died down, but Gen Prem Tinsulanonda the Thai Prime Minister, on a tour of the area on Saturday, said his country would take all possible defensive action to protect Thailand's territorial integrity.

At the newly created Tap Siem refugee camp, close to the Kampuchean border 100 people come every day to the Red Cross "training centre" to look for missing relatives.

The experience risks being macabre. Plastic bags containing the cremated remains of victims of last week's fighting, involving Thai, Kampuchean, and Vietnemese forces, are carefully labelled and left on a table for public inspection. A shuffling procession of bewildered Kampucheans finger the gruesome little packages.

According to the Thai authorities, the inhabitants of Tap Siem, squatting under makeshift tents in the scorching tropical heat are not refugees; they are Kampuchean civilians loyal to the Khmer Rouge element in the tripartite coalition forged last year to oust 180,000 Vietnamese troops from their country.

Like most Kampuchean camps along the border, the population is made up of both non-combatants and guerrillas. There re fit young men of military age now to be seen in Tap Siem.

Thailand has alleged that, in Vietnam's latest drive against Kampuchean guerrillas, Vietnamese troops crossed into Thai territory and attacked Thai forces. Thai villages close to the border were also hit by Vietnamese shelling.

Foreign correspondents who had been denied access to the immediate border area for some months, were taken at the weekend to districts which the Thais alleged had come under Vietnamese bombardment.

No Thai civilians were killed in the attacks but five Thai soldiers died in direct fighting with Vietnamese troops. The Thais say they killed at least 250 Vietnamese soldiers although only 12 bodies were recovered.

The next few weeks will be crucial for the anti-Vietnamese coalition and its allies, as the Vietnamese are expected to mount further offensives before the rainy season begins in June against two Kampuchean settlements: Nong Samet which accommodates 80,000 civilians and 1,700 guerrillas, and Ban Sangae with 20,000 civilians and 5,000 guerrillas. Both camps are controlled by the anti-communist leader, Son Sann, who has alleged that Vietnamese forces massacred Kampuchean women and children in last week's fighting. So far there is no independent confirmation of this allegation.

New bid to end Afghan conflict

By Anthony McDermott in Geneva

A NEW round of indirect talks in search of a political agreement to end the conflict in Afghanistan is due to start in Geneva today under the auspices of the United Nations.

They are to be attended by the Foreign Ministers of Afghanistan and Pakistan, but Iran has refused to take part.

Sr Diego Cordovez, the special representative of the UN Secretary-General, has expressed optimism that the talks, on the basis of previous discussions held here, in Moscow, Kabul, Islamabad and Tehran, have moved beyond procedural matters to issues of substance.

He also indicated that if progress is made, they could be extended beyond the April 22 deadline set.

This optimism would seem to be at odds with the public Soviet position on the conditions for the withdrawal of its 100,000-or-so troops in the country, and with Iran's absence.

Iran, it seems, has been showing more interest than before in being informed about UN involvement in the negotiations. But it is refusing to attend as long as representatives of the Afghan resistance movements are not present and Soviet military occupation continues.

The talks here will not be direct. Instead, Sr Cordovez will be acting as an intermediary between the parties negotiating the draft of a political agreement.

Four points, in particular, will be on the agenda: withdrawal of foreign troops from Afghanistan; non-interference of outside countries in that state's internal affairs; international guarantees against such interference; and in particular, means of enabling the voluntary return of Afghanistan refugees abroad.

A crucial point for the Soviet Union is the question of "interference," and the recognition of Mr Babrak Karmal's Government, which both Pakistan and Iran have refused.

This latest series of talks will be the second held in Geneva since Sr Javier Perez de Cuellar, the UN Secretary General accompanied by Sr Cordovez, visited Moscow in March.

Saudi officials seek to end speculation over budget policies

BY ROGER MATTHEWS IN RIYADH

SAUDI OFFICIALS sought to dampen speculation yesterday that the resignation last week of the governor of the Saudi Arabian Monetary Agency was related to the intense debate within the kingdom over the size of cuts to be announced in next Wednesday's budget.

The sherp decline in Saudi Arabia's oil income during the 1982-83 financial year, which ends on April 12, has forced ministers into difficult decisions over the extent to which foreign reserves should be drawn down in order to maintain the pace of the development programme.

Sheikh Abdel-Aziz al-Quraishi's nine-year tenure as governor of Sama — the kingdom's central banking and investment authority—has been marked by what one banker described as "a sensibly cautious and responsible management of the kingdom's assets."

Although the governor had previously expressed a desire to return to private business, his departure at this time has fuelled speculation that it could herald a shift towards policies more related to shorter-term political considerations.

Some Sandis believe that King Fahd will seek to avoid the unpopuler domestic consequences of significant budget cuts by accepting a much larger budget deficit in the next financial year. This deficit would be covered by foreign reserves, while awaiting a revival in oil demand.

The Government had projected oil revenues of some $80bn (£53.3bn) during the current financial year, but latest estimates suggest it will have received less than $65bn.

Total revenue, including investment earnings, was supposed to have approximately balanced anticipated government spending of nearly $92bn.

However, officials say that the budget deficit for the financial year now ending will be significantly less than these figures indicate, due to government under-spending.

With a further fall in oil revenue during the 1983-84 financial year apparently inevitable and with only limited scope for reducing commitments, it is accepted in Riyadh that the kingdom has no option but to realise more of its estimated $150bn of reserves.

Even if the Government chose not to commit itself to a single new project during the coming financial year, the current development programme is already believed to require spending of at least $40bn.

The Government also has to face the prospects of supporting Iraq's war effort by some $6bn-$10bn annually until Iran agrees to a peace treaty.

The appointment of a new governor at Sama is not expected for several weeks, but the front-runner is Mr Hamid al-Siyari, who has been named acting head of the agency.

Italy's aluminium industry receives £116m boost

BY JOHN PHILLIPS IN ROME

THE ITALIAN Government has allocated L250bn (£116m) for an ambitious restructuring plan of the country's troubled aluminium industry.

The money, voted at a meeting of the inter-ministerial industrial policy committee, is expected to provide a breath of fresh air for MCS, the subholding of the Italian state holding company Efim, through which most of Italy's aluminium industry is controlled.

Senior executives of MCS are understood to have threatened to place most of 11,000 people employed in the industry on state subsidised layoffs unless the subsidy was granted.

Contrary to expectations, however, the meeting of economic Ministers, together with Sig Amintore Fanfani, the Prime Minister, gave no public indication whether the restructuring plan will include the long-hoped-for participation by the Swiss concern Alusuisse.

Nasa confident after Challenger mission

By William Hall in New York

CHALLENGER, the second of four U.S. space shuttles which will eventually be flying to and from space every few weeks, landed at Edward Air Force base in California on Saturday after a near faultless five-day maiden flight.

Work immediately began on preparing the space craft for its second flight in two months' time.

The U.S. space shuttle programme is running badly behind schedule as a result of technical delays, and Challenger's performance has boosted confidence of officials of the National Aeronautics and Space Administration (Nasa) that they can keep to their timetable, requiring four more shuttle missions before end of the year.

However, while Challenger itself performed well, the success of the main purpose of the trip—to launch the biggest and most advanced communications satellite in the world—is still in considerable doubt.

The 2½-tonne tracking and data relay satellite (TDRS) was launched from Challenger on Tuesday but a Boeing rocket which was to push it into stationary orbit 22,300 miles above the equator failed, and the satellite is now badly out of position.

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Statoil drilling platform given loan clearance

By Hazel Duffy in London

AN $84m Eurodollar loan package has been completed by Lazard Brothers and Christiana Bank covering 80 per cent of the financing of a drilling platform to be used by Statoil, the Norwegian state oil company.

The 10-year loan at floating rates is the largest foreign financing package for a vessel constructed in e Norwegian yard. The platform, the Ross Isle, was built by Kaldnes mek Verksted in Tonsberg.

The construction was financed by an NKr 471m ($65.7m) and loan guarantee facility, which was also managed and syndicated by Lazards.

The Eurodollar loan was completed in the face of considerable reluctance on the part of the banks to become further involved in the shipping and oil sectors.

Mr David Thomson, Lazards' director leading the negotiations, admits that he was "surprised at this reluctance," particularly given the status of the charterer, Statoil, which is taking the platform on an eight-year contract for drilling in Norwegian waters.

The co-managers of the floating rate facility, which has been arranged on behalf of a Norwegian limited partnership managed by A/S Rosshavet, are Manufacturers Hanover Trust and Chase Manhattan Bank.

OVERSEAS NEWS

INDIA'S TEXTILE INDUSTRY

No end of trouble at the mills

BY ANTHONY MORETON, RECENTLY IN BOMBAY

MANY OF Bombay's textile mills have been paralysed for the past year by a strike which has highlighted a general malaise in the Indian textile industry, the largest in the non-Communist world.

The dispute—described by one senior civil servant as "the longest, biggest strike the world has ever seen"—appears to be fizzling out. Workers are filtering back to work in increasing numbers or are being replaced by others.

But it has slashed Bombay's production — 24.3m kgs of cotton and blended yards were produced last year, compared with 140m kgs in 1981. Output of cloth fell even more severely, from 908m metres to 174m.

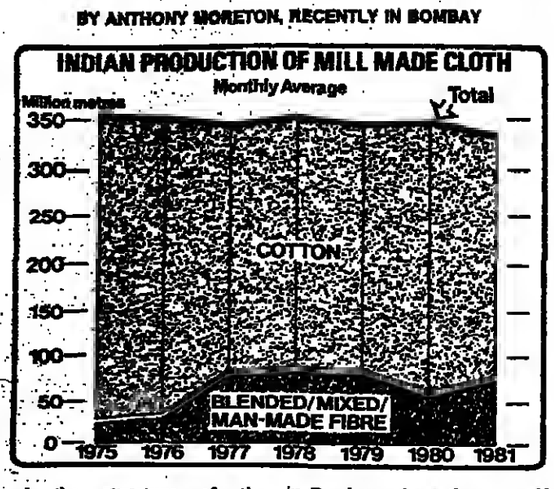
The dispute is ostensibly about money. Dr Datta Samant, the leader of the strikers, is calling for a £30 a month increase on the £50 earned by the lowest-paid workers.

The dispute has wider political ramifications: Dr Samant is already a member of the Maharastra (or state) legislative assembly and has unsuccessfuly stood for the Lok Sabah (or lower house) in New Delhi. Members of Mrs Indira Gandhi's ruling Congress party fear that if Dr Samant succeeds with the strike he will get a strong power base in the city from which to challenge them.

"The strike will not end until I win," he says. "I have seen the millworkers. I am their friend. They will not go back to work until I say so."

The Bombay Millowners' Association disputes this. It says that 115,000 of the city's 180,000 workforce are back at work, many of the mills are on three-shift production and output is up to 57 per cent of the pre-strike level.

Whoever wins, the strike is symptomatic of much deeper troubles in the industry. A World Bank report found it "in very poor shape by Western standards. There was no appreciation of the fact that often what they (Indian industry) regarded as efficient modern enterprises were in reality pitiful wrecks, hopelessly overstaffed and producing poor-quality goods at very high cost." There are two fundamental problems: Government policy, which restricts the amount of new investment the private sector can undertake; and the structure of the industry, with the Government acting to protect the inefficient state company, the National Textile Corporation.



Poor productivity and falling quality have hit exports particularly badly in recent years. Sales of cotton piecegoods fell from 669.36m sq metres in 1973 to 356.7m in 1980-81, the last year for which figures are available. Similarly, sales of cotton yarn dropped from a peak of 309.98m kgs in 1976-77 to 152.4m kgs last year.

The Bombay strike has contributed to this, since the 60 mills in the sprawling city account for two-thirds of India's exports.

India has the largest textile industry in the world after China. Something like 9m people spin and weave cloth and many more make up garments, spin silk, and produce carpets.

The country has 21.93m spindles and 210,000 looms. In Britain, by comparison, textiles accounts for some 311,000 jobs, some 1.3m spindles and 24,000 looms.

Indian production is grouped in three sectors: the composite mills (what the West would call vertically-integrated concerns); the powerloom sector; and the handloom (or village) sector. Each produces roughly the same amount of cloth each year though output per man is low in the powerloom sector and handloom output even lower.

The heaviest concentration of composite mills is to be found in Bombay, where there are 60—12 in the nationalised National Textile Corporation, one in the Maharashtra Textile Corporation and the rest in the private sector. The other two principal textile centres are Ahmedabad, to the north of Bombay, and in Coimbatore, in southern Tamil Nadu.

Powerloom plants are to be found over much of India. They are mechanised but have little modern machinery and usually comprise companies with a capital of under £2m or fewer than 50 looms.

The industry's lack of investment stems from a government decree of 1952 that the then-existing number of looms—210,000 in the mills—could not be exceeded. The policy is designed to protect the village handloom industry. A company can put in a new loom, but only by scrapping an old one. "We have few modern Sulzers (the Swiss machine that is the industry's benchmark) in use," complains Mr Bhaskar Kakatkar, adviser to the Cotton Textiles Export Promotion Council. "It's a terrible disadvantage."

Meanwhile, private manufacturers complain that the nationalised NTC is a drag on their performance. Mr Dhirubhai Ambani, chairman of Reliance Textile Industries, one of the fastest-growing concerns in Indian industry, says: "The nationalised group has no commitment to make profits and so goes on producing at less than cost. This government sees a nationalised sector as one of its political objectives and tolerates the consequences.

"The inability to work profitably puts immense pressure on the profitable companies in the private sector by forcing them to match the ridiculous prices which the NTC charges. Their margins are depressed and they face a hopelessly difficult task competing."

The independent Bombay Textile Research Association has suggested that the industry needs capital investment of at least £1.5bn to be properly modernised. Since the mills cannot put up this sort of money themselves they have been to the Government seeking £117m to tide them over. The Government has yet to reply.

The need for modern plant is all the more important because of India's textile exports drive. In 1981 it had a big breakthrough with a major contract for the Soviet Union, which agreed to take 200m metres of cloth in both 1982 and 1983, with the possibility of more in subsequent years.

But the Bombay strike had a catastrophic effect on the deal. Shipments by the end of November totalled no more than 87m metres.

Soviet officials have said they will make up the difference this year and have talked of a total 275m metres in 1983. But there have been signs that Russia is less enthusiastic about the deal.

Bombay mill owners would like to move out of their cramped old factories and into modern premises near the cotton-growing areas.

Mr Sunil Khatau, executive director of Khatau Mills, employs over 6,000 on two sites; one, at Byculla in the heart of the city, is over 100 years old. "The mills are just not generating sufficient profits to pay the higher wages Dr Samant wants," he says, "and the only answer is to move out."

"We are overcrowded and there are enormous problems over power supplies in Bombay. We have even bought land to move to. If we could open elsewhere we could produce our present output from a workforce of 2,500."

But the Maharastra government—fearing serious job losses in Bombay—has forbidden any company to move out and it would need pressure from the union government in New Delhi to get the law changed.

STATISTICAL TRENDS: FINLAND

Forestry becomes less important

DESPITE the recession, Finland's economic situation has remained favourable in comparison with many other advanced economies. There was particularly rapid growth of real gross domestic product (GDP) in 1979-80, the highest rate in the Organisation for Economic Co-operation and Development (OECD). Restricted but positive growth was then achieved in 1981 and 1982.

The external balance has improved, partly due to stagnating domestic demand, but significantly due to increased exports to the Soviet Union. Crude oil makes up the bulk of Soviet imports; Nesto, Finland's state-owned oil company, is the largest Western buyer of Soviet oil.

After peaking at 13.8 per cent in December 1980, consumer price inflation fell steadily to stand at 7.6 per cent in October, the lowest since August 1979. It rose again to 9.0 per cent in December, to push the 1982 average to 9.3 per cent, considerably above the OECD average. Unemployment is expected to peak in 1983 at 7.0 per cent, below the levels of the previous recession.

Commentary by Our Economics Staff; data analysis by Financial Times Statistics Unit; charts and graphs by Financial Times Charts Department.

In October 1982 the finnmark was devalued by 9½ per cent in two steps, the second one immediately after the Swedish 16 per cent devaluation.

At the same time as the devaluation, a package of policy measures was announced to try to improve the competitiveness and profitability of the manufacturing sector.

In manufacturing, capacity utilisation has continued to fall as a result of a decrease in production and a simultaneous growth of capital stock. Investment activity has mainly been sustained by the continuation of projects started earlier. According to a Bank of Finland investment inquiry, 35 per cent of companies forecast a rise in their capacity utilisation in the latter half of the year, an indication that they expect a revival in demand towards the end of 1983.

Agriculture and forestry contributes about 10 per cent to GDP, a fall from 25 per cent in 1950. Strong promotion of active forest cultivation and maintenance has produced a capital intensive industry.

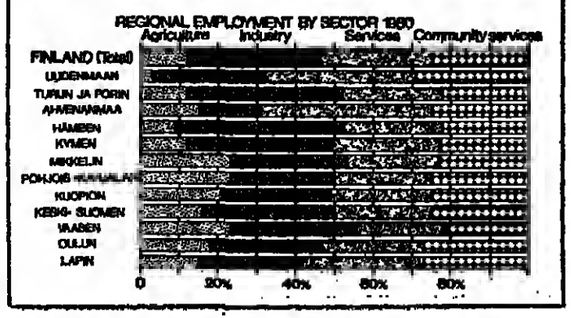
Total stands of forest in Finland are estimated at 1,600m cu metres, the stock being concentrated on a few species; 44 per cent pine, 35 per cent spruce, 15 per cent birch.

During 1982 the forestry industry was particularly hard hit. There were large production stoppages and compulsory holidays. Output of wood products and pulp and paper registered declines of 12.4 per cent and 3.8 per cent in the first eight months.

The first half of 1982 showed a clear surplus in foreign trade but during the second half the deficit was created. Export volume went down in almost all industrial sectors except metal products and engineering. Import volume of consumer goods and some raw materials grew, although energy imports showed a decline.

For the first time since 1975, Finnish export prices went up (by 7 per cent) faster than import prices (4 per cent).

Trade with the EFTA, the EEC, Comecon and the developing countries all showed a surplus, Japan and the U.S. producing the deficit. The biggest individual deficit was in trade with West Germany, FM 2.9bn, and the biggest individual surplus in trade with Great Britain, FM 2.1bn.



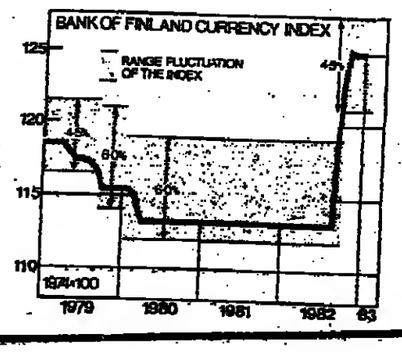
General

ECONOMIC INDICATORS

	GNP e.p.	Industrial prod.	Exports (goods)	Imports (goods)	Bal. of payments FM m.	Cons. prices Dec/Dec %	Unemployment %
	Real annual change %						
1975	0.9	−3.9	−16.9	0.0	−7,952	18.2	2.2
1976	0.3	2.1	17.1	−4.0	−4,455	12.3	4.0
1977	0.4	−0.9	9.8	−8.3	−580	11.9	6.1
1978	2.3	4.1	7.2	−5.0	2,406	5.9	7.5
1979	7.6	10.6	9.8	18.2	−761	8.6	6.1
1980	5.0	7.9	9.0	12.9	−5,155	13.7	4.8
1981	1.3	3.2	3.0	−4.0	−1,315	10.0	5.3
1982*	1.0	0.0	−0.5	−0.5	−500	9.8	6.3
1983†	2.0	2.5	3.0	1.5	0	9.0	7.0

* Estimate
† Forecast

Source: Finnish National Statistics



EARNINGS

	Agriculture	Forestry	Industry	Construction
	Wage and Salary Index			
1977	131.4	138.3	126.7	116.6
1978	141.4	147.9	135.6	123.4
1979	157.0	158.7	149.8	134.6
1980	175.1	182.1	168.2	148.5
1981	198.2	199.9	190.5	168.0
1982Q1	211.7	200.6	201.0	179.2
Q2	220.3	222.1	211.9	182.4
Q3	221.3	214.2	210.7	184.3
	Average earnings FM/hr			
1981 Male	18.71	*	24.17	25.68
Female	15.67	n.a.	18.43	n.a.

* Average earnings FM/day 1981 226.01

Source: Central Statistical Office

MIGRATION

	Net immigration Total	Nordic
1977	−10,629	−9,967
1978	−9,143	−7,696
1979	−6,539	−6,073
1980	−1,193	−1,140
1981	+5,723	+5,509
1981Q1	−173	+212
Q2	+1,412	+1,440
Q3	+2,891	+2,375
Q4	+1,270	+1,058
1982Q1	+787	+1,030
Q2	+2,139	+2,192
Q3	+3,169	+2,575

Source: National Statistics

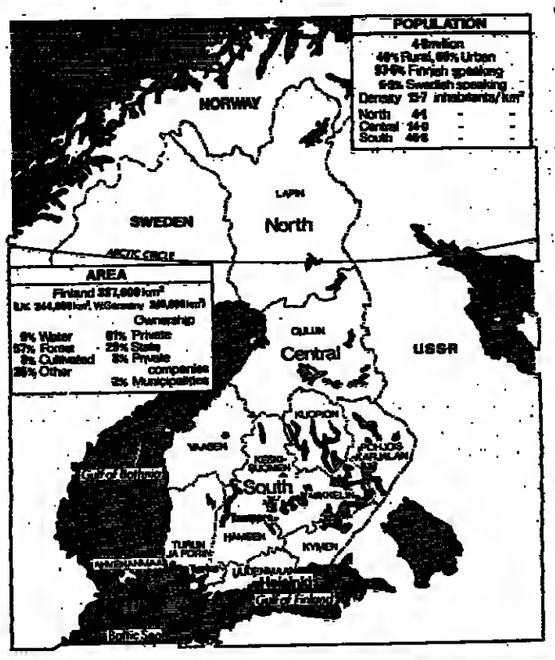
Agriculture

YIELD OF MAIN CROPS 1982

	Cultivated Area 1,000 ha	Total Yield M kg	Yield 100kg/ha 1982	1981	1950
Winter Wheat	15.7	48.5	30.9	18.3	15.7*
Spring Wheat	127.2	386.9	30.4	22.5	
Rye	16.3	35.0	21.5	15.7	16.1
Barley	540.4	1,598.5	29.6	19.0	15.3
Oats	459.3	1,319.9	28.7	22.2	16.8
Potatoes	39.1	601.1	153.7	129.5	136.7
Sugar Beet	32.4	756.1	233.4	214.7	228.6
Hay	445.3	1,689.4	37.9	37.3	30.1
Silage	244.4	4,319.2	176.7	164.9	136.1
Oil Seeds	63.7	96.3	15.1	12.4	n.a.

* All types of wheat

Source: Agricultural Economics Research Institute



FARM INCOME TRENDS
FMm

	Total revenue	Total costs	Farm income	Index
1975	8,091.2	4,991.9	3,099.3	100.0
1976	9,261.0	5,762.7	3,498.3	112.9
1977	9,967.0	6,231.0	3,736.0	120.5
1978	10,233.1	7,191.8	3,041.3	98.1
1979	11,100.6	8,185.4	2,914.8	94.0
1980	13,103.4	9,714.1	3,389.3	109.4
1981	14,641.4	11,242.9	3,398.5	109.7
1982	17,151.3	12,471.1	4,680.2	151.0

Source: Agricultural Economics Research Institute

Forestry

EXPORTS OF FORESTRY INDUSTRY PRODUCTS

	1970	1975	1980	1981
	By Value FM m			
Timber & Wood	1,588	2,135	7,638	6,860
of which %:				
Sawn goods	58.2	55.9	64.9	57.4
Plywood	24.1	20.9	14.7	18.6
Paper industry	3,709	7,058	15,304	16,663
of which %:				
Mechanical pulp	0.3	0.2	0.2	0.1
Chemical pulp	31.8	19.5	22.3	21.7
Paper	43.1	51.7	50.1	50.1
Paper board	17.9	16.8	15.5	16.2
Converted pap. & p.b.	6.8	12.3	11.8	11.5
Total	5,877	9,193	22,942	23,523
	By volume 000 tons			
Total	5,790	4,331	7,149	6,932

Source: Central Association of Finance for Industry

PAPER AND BOARD PRODUCTION
West Europe

	Pulp*	Paper & board
	% of total†	
Sweden	34.4	15.0
Finland	29.5	15.1
West Germany	8.6	20.8
France	8.0	13.8
Norway	6.5	3.4
Austria	4.9	4.3
Italy	3.5	11.9
Switzerland	1.3	2.3
Others	3.1	15.0
Total W. Europe	100.0	100.0

* Pulp for paper/board making
† Based on 1982 Jan-Sept

Source: European Paper Institute

NATIONAL BOARD OF FORESTRY LAND USE (1981)

	North	Central	South	Total
	1,000 hectares			
Subject to cutting				
Not subject to cutting	3,172	121	89	3,382
Total	6,056	1,504	786	8,346
Subject to cutting of which:	% of cutting land			
Forest	61.8	62.5	76.4	64.0
Poorly prod. forest	13.3	14.1	10.1	13.1
Waste land	24.9	23.4	13.5	22.9

Source: NBF

INDUSTRIAL FIXED INVESTMENT
Annual % changes

	1981	1982	1983
By Industrial Sector:			
Forest industries	2	−12	−19
Metal industry	10	7	−13
Other manufacturing	−9	1	9
Total manufacturing	−2	−2	−6
Elect., Gas & Water	11	30	−20
By type of investment:			
Building	−5	2	−9
Machinery & Equip.	3	3	−9
Total ind. fixed inv.	0	3	−9

Source: Bank of Finland Investment Inquiry, Dec. 1982

Trade and Industry

INDUSTRIAL PRODUCTION

	Investment goods	Manufacturing	Intermediate	Consumer Goods	Timber Fellings M cu.m m.a.v.	Construction work in prog. M cu.m end of period
	1975=100					
1978	86	105	112	108	2.69	42.78
1979	94	116	127	114	3.47	47.62
1980	106	126	136	123	3.92	49.57
1981	116	131	138	129	3.70	47.14
1981 Q1	109	127	135	123	3.84	51.35
Q2	114	129	137	127	3.82	48.55
Q3	122	133	142	131	3.75	49.21
Q4	122	131	138	128	3.70	48.10
1982 Q1	120	129	136	125	3.67	51.15
Q2	121	130	140	125	3.34	51.07
Q3	107	122	140	120	2.94	52.65
Nov	121	129	136	122	4.15	—

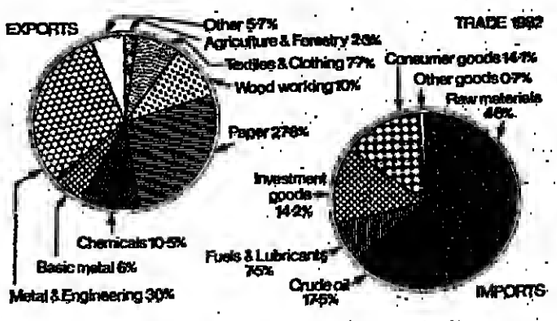
Source: OECD

MANUFACTURING INDUSTRY PROFITS†

	1960-73	1974-80
	Gross Profits	
Finland	37.9	35.3
Sweden	28.2	21.9
Norway	28.6	28.3
Others‡	30.7	27.4
	Net Profits	
Finland	25.6	26.5
Sweden	20.7	12.3
Norway	20.4	19.8
Others‡	24.5	19.6

† Gross and net operating surplus related to gross and net value added
‡ Average of Can., W. Ger., U.S. and UK

Source: OECD



FINNISH MANUFACTURING TRADE ($m)

	1964	1973	1981
Exports fob to:			
Soviet Union	125	378	2,957
Other OECD	489	2,170	6,239
Other	99	324	1,279
Total	713	2,872	10,473
Trade bal (fob: cif)			
Soviet Union	40	253	2,689
Other OECD	−428	−702	−1,111
Other	54	188	754
Total	−314	−261	2,322
Share of total merchandise exports	85.3	75.1	74.8

Source: OECD

WORLD TRADE NEWS

China offers better terms for joint ventures

PEKING — China will offer longer tax holidays and greater opportunities to sell in China as part of efforts to encourage more foreign investors to set up joint ventures there.

Li Hao, deputy Secretary General of the State Economic Commission, told a news conference that outside its four special economic zones, China now has 48 joint ventures with foreign investment of $102m and overall investment of $222m.

"We hope the adoption of each measures will enable China to make greater strides in joint ventures," Li said. He conceded there had been a dampening of enthusiasm among foreign investors, and said some had shown "unnecessary worries."

China is still clarifying its economic laws and regulations, and some foreign businessmen have held back to await laws they feel provide greater certainty.

Li said the new measures would exempt a joint venture from income tax for its first two years and require payment of only 50 per cent of the tax for the next three years. At present, the first year is exempt and half the tax must be paid for the next two years.

Joint ventures now also must export enough to earn the foreign exchange needed to pay the foreign partner's foreign costs and profits. This limits the amount the ventures can sell on China's domestic markets.

Li said provision would be made to give them a bigger share of the domestic market, and not all ventures would be required to keep a balance in their foreign exchange earnings. He said machinery, equipment and other material bought abroad for a joint venture would be exempt from customs duties and China's industrial and commercial tax.

For goods and services bought on China's domestic market for a joint venture project, the ventures will be able to pay in Chinese currency and at Chinese domestic prices, Li said. Not having to pay foreign currency and export prices for goods purchased locally would mean less pressure on joint ventures to export to earn foreign exchange.

Li said, however, that the ventures would have to pay international market prices for precious metals, coal and timber, although payment could be in Chinese currency. Water, gas and electricity would be paid for in Chinese currency at domestic rates, he said.
AP

Italians win Venezuelan aircraft deal

By John Phillips in Rome

AERITALIA, Italy's leading aircraft manufacturer, announced yesterday that it has won a contract worth $150m to supply eight military transport G222 aircraft to the Venezuelan Government.

Company officials said two of the aircraft will be used by the Venezuelan Army and six by the Air Force. The deal includes an agreement to provide spare parts and to train pilots and ground staff in Venezuela. Delivery is expected to commence this summer and is to be completed by the end of the year.

The deal underlines not only the high world-wide demand for the twin engine G222—83 of them have been sold so far to seven countries—but also the relatively robust shape of the state-owned Aeritalia, which last year increased its sales by an impressive 52 per cent. In January it sold five G222s to Nigeria for $117m.

Anthony Robinson in Moscow reports on the Soviet approach to foreign trade

Falling oil price boosts Moscow's earnings

DESPITE sharply falling world prices for oil and gas, its major export items, The Soviet Union managed to cut its trade deficit with the industrialised West last year to a mere 100m roubles (£92.45m), from 900m roubles in 1981 and 3.6bn roubles in 1975.

It did so by the simple expediency of consistently undercutting the oil prices charged by the Organisation of Petroleum Exporting Countries (Opec) and thus raising the volume of its oil and product exports to the West by an estimated 40 per cent. At the same time it cut its own imports.

As a result Soviet exports to the West rose by 1.6bn roubles to 18.8bn roubles last year while imports rose only 800m roubles to 18.9bn roubles, reflecting a drop in real terms after inflation.

To find the extra volume of oil, the Soviets reduced oil deliveries to Eastern Europe by around 10 per cent and stepped up imports from countries like Libya, Iran and Iraq, mainly in exchange for arms.

The way in which it has boosted its hard currency earnings under such unpropitious circumstances reflects the way Soviet foreign trade enterprises behave.

Those controlling oil and gas, particularly, which earned nearly 80 per cent of total hard currency income from the West last year, are given hard currency targets and told to fulfill them, whatever the cost.

At the same time as it was boosting its hard currency earnings, a combination of increased arms sales and lower imports also secured a larger trade surplus with the developing world. The Soviet Union portrays itself as the champion of the Third World and rails against the discrimination of capitalist states against the aspirations of the developing countries but its own trade pattern contradicts the propaganda.

Last year, for example, Soviet exports to the developing world rose 1.5bn roubles from 8.7bn roubles to 10.2bn roubles while its imports from the area dropped 1.1bn roubles to 8.7bn roubles. As a result, the Soviet Union raised its surplus on Third World trade from 900m to 3.5bn roubles.

A major factor in lower Third World imports was a virtual halving of grain imports from Argentina. The Soviet-Argentine trade volume dropped to 1.29bn roubles from 2.4m roubles in 1981.

On the other hand, trade turnover with Libya virtually tripled from 551m roubles to 1.35bn roubles. Libya has become the Soviet Union's second largest Third World trading partner, after India.

Libya, together with Syria, Iran and Iraq, India, Indochina and several African and Latin American countries, is a major customer of Soviet arms salesmen, who are believed to have sold nearly $7bn worth of military equipment last year.

Arms sales are far and away the most successful and valuable sector of Soviet engineering exports, although the exact figures are carefully concealed.

In other fields, however, the Soviet Union has been markedly unsuccessful in boosting its engineering exports—especially in the competitive hard currency markets. Last year, engineering exports of all kinds, including civilian aircraft, nuclear power plants, power station equipment, transport equipment and machine tools accounted for only 8.1bn roubles of total Soviet exports of 63.2bn roubles. Of this total, some 73 per cent went to the virtually captive markets of Comecon, 23 per cent to other Socialist countries and only 4 per cent to the West.

Despite the higher proportion of engineering products in Soviet sales to Comecon, however, it is still principally a supplier of energy and raw materials to Comecon. Under the system of pricing oil which Comecon countries use, buyers have had to pay higher prices for the reduced volume of Soviet oil they received last year, at the same time as Soviet Union and all other producers were cutting their prices on the world market.

As a result, Soviet exports to Comecon rose 2.6bn roubles last year while Comecon countries, faced with recession in Western markets and burdened by heavy debts, stepped up their own exports to the Soviet Union by 4.1bn roubles. This reduced the Soviet trade surplus, effectively its subsidy to Comecon, to 3.7bn roubles from 5bn roubles in 1981.

Moscow's lack of success in penetrating Western markets with engineering products is partly a reflection of the technological backwardness, poor reliability and reputation for bad service which Soviet engineering products have.

The resulting reliance on raw material and energy exports is somewhat embarrassing to the Soviet Union, but is likely to continue as large sectors of Soviet industry lag further behind the pace of technological change in the West.

Under the Soviet system, most enterprises or ministries have only a vague concept of the real costs of production, due to the artificially-fixed pricing system. This means that the net resource cost to the Soviet Union of many of the products it exports is probably higher, in some cases far higher than the hard currency income it derives from them.

On the other hand, the cost to the Soviet Union of trying to produce many of the items it imports from the West would also be far higher than the cost of importing them.

This is reflected in one comment by a veteran British businessman: "Nobody ever sells anything to the Soviet Union—they make up their mind what they want in advance and get it." This is one reason why high technology sanctions against the Soviet Union are so difficult to enforce.

Anything the Soviet Union does not have the skills or equipment to make will be imported—whatever the cost and no matter how much needs to be paid to "fixers" to arrange the deal. It will still be cheaper and easier this way than trying to produce the items at home.

Foreign trade is playing an increasingly important role in the consumer goods area now, leaving aside the massive imports of grain, meat, butter and other foodstuffs. Many Third World countries, like India, produce much higher quality consumer goods and textiles than the Soviet Union.

The Soviet authorities have found one painless way to soak up the excess roubles swilling around the economy due to wage rises unmatched by increases in production: import consumer goods cheaply from the Third World and sell them at inflated prices on a domestic market starved of quality, colour and variety.

UK assembles £100m development aid for industry in India

BY JOHN ELLIOTT, RECENTLY IN NEW DELHI

FOUR PACKAGES of development aid, worth a total of over £100m are being assembled for specific industrial areas in India by the UK Government.

Both the power sector and railways have been allocated £30m each and £31m has been set aside for coal development. A fourth tranche of £15m is now under consideration for the country's rapidly expanding oil and offshore gas activities.

The aid will be paid against orders placed in the UK and the objective is to increase British exports to India by focusing the attention of Indian authorities and UK companies on specific areas.

The funds, which are all grants, will come out of the UK's regular bi-lateral aid budget, of about £105m a year, and are expected to be spent over the next two or three years.

They are separate from one-off allocations made for specific large projects such as a power station being built at Rihand by Northern Engineering Industries an a telecommunications contract for which the British System X is a contender.

A substantial extra allocation would also be made for the Daitari steel works. The UK still hopes to receive orders worth £650m if this project goes ahead despite Davy McKee losing an overall £1.25bn turnkey contract for the whole steel works last year.

Most of the new packages of grants are expected to be spent on comparatively small orders. The railways aid is being targeted at breakdown trains, brake systems and marshalling yard equipment.

The coal grants—which constitute an extension of an existing aid arrangement—are aimed at orders for equipment such as walking drag lines, and fully automated long wall mining machinery.

In the power sector, the targets will include two gas turbines for a zinc project.

The UK is relatively well established in these areas in India but it has made far less headway in the fourth sector—offshore oil and gas exploration and production.

Government ministers in London are concerned about the UK's performance, in this area, and are planning a trade mission to India next winter in addition to the aid allocation.

SHIPPING REPORT

Bright spot in the Caribbean

By Hazel Duffy, Transport Correspondent

SHIPBROKERS, casting around for signs that higher rates in some trades might be sticking, settled for the Caribbean tanker market last week as one bright spot.

Galbraith Wrightson commented on "a considerable increase in demand." Prospects for rate improvements in the U.S. coast market were "probably quite good," E. A. Gibson reports a much improved amount of fresh inquiry in the area, enabling rates to show substantial improvements, but Galbraith's sounds a cautionary note on the Caribbean/UK and Continent trade, where few figures still apply.

West Africa and the Mediterranean have also come up with increased enquiries for tanker tonnage, although the excess of supply over demand in West Africa, in spite of Nigerian oil prices holding firm, have held rates at very depressed levels.

The dearth of activity in the Gulf states, however, provided no prospect of any improvements in VLCC rates. The enormous problems in securing any type of employment for these vessels makes rates almost of secondary importance, Galbraith suggests.

Ship sale reports point to buyers beginning to turn their attentions to larger bulk carriers—a Norwegian-owned 118,000 tdw, built in 1976, has been committed to London Greek buyers at a price in the region of $9.85m—while smaller bulk carrier sales continue to confirm the upward trend in prices.

Brokers report the sale of a 26,000 tdw the "New Westminster City," under the British flag built in 1972, for around $5m to Greek buyers.

The dry cargo charter market was reported "rather dull" by Denholm Coates. The Gulf/Japan grain level eased further to $18.10 for a 42,000 ton carrier but the same charterer paid $21.55 for a 33,000 ton carrier on the same run and a very similar date.

World Economic Indicators

		UNEMPLOYMENT			
		Mar. '83	Feb. '83	Jan. '83	Mar. '82
UK	000's	3,172.4	3,199.4	3,225.2	2,820.8
	%	13.6	13.7	13.8	12.1
U.S.	000's	11,381.0	11,489.0	11,446.0	9,881.0
	%	10.3	10.4	10.4	9.0
		Feb. '83	Jan. '83	Dec. '82	Feb. '82
W. Germany	000's	2,535.8	2,487.1	2,223.3	1,935.3
	%	9.6	9.4	8.4	7.3
France	000's	2,080.1	2,129.9	2,131.4	2,003.8
	%	9.2	9.4	9.4	8.8
Italy	000's	2,702.3	2,690.2	2,585.4	2,315.5
	%	12.0	11.9	11.4	10.3
Netherlands	000's	778.7	776.1	764.5	599.7
	%	14.5	14.5	14.3	11.2
Belgium	000's	574.3	579.8	580.2	508.6
	%	14.1	14.3	14.3	12.5
		Dec. '82	Nov. '82	Oct. '82	Dec. '81
Japan	000's	1,250.0	1,240.0	1,290.0	1,190.0
	%	2.3	2.3	2.4	2.1

Sources: Eurostat and others.

Hopes of peace as steel talks are called

TALKS aimed at ending the week-long strike by South Yorkshire steelworkers open in Rotherham today as members of the TUC steel committee enter discussions with officials of the Advisory, Conciliation and Arbitration Service (Acas) on a national pay deal.

The talks, between Iron and Steel Trades Confederation (ISTC) officials and British Steel Corporation (BSC) management, come amid conflicting claims over the level of support for the strike.

Some union officials insist that support remains strong, while others confirm BSC's view that the revolt over the redundancy programme is crumbling.

The first signs that the strike was losing impetus came at the weekend with reports that some ISTC members at BSC's Stocksbridge plant had returned.

Mr Bill Sirs, the ISTC general secretary, said the union had no plans to escalate the action, which has affected 8,000 workers and halted production at seven sites.

Union leaders refuse to intervene at Cowley

BY ARTHUR SMITH, MIDLANDS CORRESPONDENT

NATIONAL union leaders have refused to intervene in the "cleaning-up strike" that has halted all production at British Leyland's car assembly plant at Cowley, Oxford.

New talks to end the dispute threatening the recovery programme of the Austin Rover volume cars division, are planned at plant level today. Both unions and management are aware of the consequences of the dispute for the company, but neither side was optimistic of progress last night.

BL, when faced with an impasse in local negotiations, has tended with great success in recent years to bounce the issue to national union leaders.

Following a renewed strike vote by the 5,000 Cowley workers last week, Mr Harold Musgrove, the Austin Rover chairman, had secret talks in London with Mr Moss Evans, general secretary of the Transport and General Workers Union (TGWU) and Mr Terry Duffy, president of the engineers union.

"We made it clear that this is not a matter for national officials. At this stage we are not going to intervene," said Mr Ken Cure, the senior BL negotiator for the engineering union.

Mr Cure, who attended the talks with Mr Musgrove, said the dispute had to be settled at local level. The company had shown "a remarkable degree of ineptitude" in the manner and the timing of its decision to end the long-established practice of cleaning-up time.

Cowley workers, who for several decades have ended every shift three minutes early, walked out two weeks ago in protest at management moves to make them work the full 39-hour week.

Austin Rover insists workers must produce a full week's output to yield the necessary economies from the £200m investment that has taken place at Cowley for the launch of the Maestro model.

The management, having publicly declared that it cannot compromise on the principle of the early finish, will find it difficult to arrive at a peace formula in today's talks.

Mr David Buckle, Oxford district secretary of the TGWU, who will lead the local negotiations, said last night that nothing had changed since the workers had overwhelmingly rejected the management's proposals last week.

Kraft workers to fight closure

BY A CORRESPONDENT

WORKERS AT the Kraft Food factory at Kirkby on North Merseyside, where 930 jobs are to go from July, yesterday pledged to fight the company's decision to transfer its cheese production to plants in Belgium and Germany. Officials of the shopworkers union and Usdaw, the main union involved, explained the details of the proposals to a mass meeting of the workforce. They then voted 100 per cent to support the campaign, the details of which will now be worked out at a joint meeting of the union leaders later this week.

Meanwhile, a letter will be sent to management expressing "shock and disguest" at the decision, which will leave just 220 workers at the plant.

Petrol study strikes blow to anti-lead group

BY DAVID FISHLOCK, SCIENCE EDITOR

CAMPAIGNERS for the abolition of lead additives from petrol received a blow to their case after results of lengthy studies on the intelligence of young children in large British cities were published.

The studies, involving thousands of children over more than three years, showed that atmospheric lead levels had no statistically significant effect on their intelligence. Instead, social factors, this time investigated more carefully than in previous studies, proved to have a significant influence on intelligence.

Scientists said their research showed "no definite evidence that lead at present urban levels is affecting children's development."

These results were disclosed at the annual conference of the British Psychological Society at the University of York yesterday at a special symposium on lead and health.

Lloyds to create new money market division

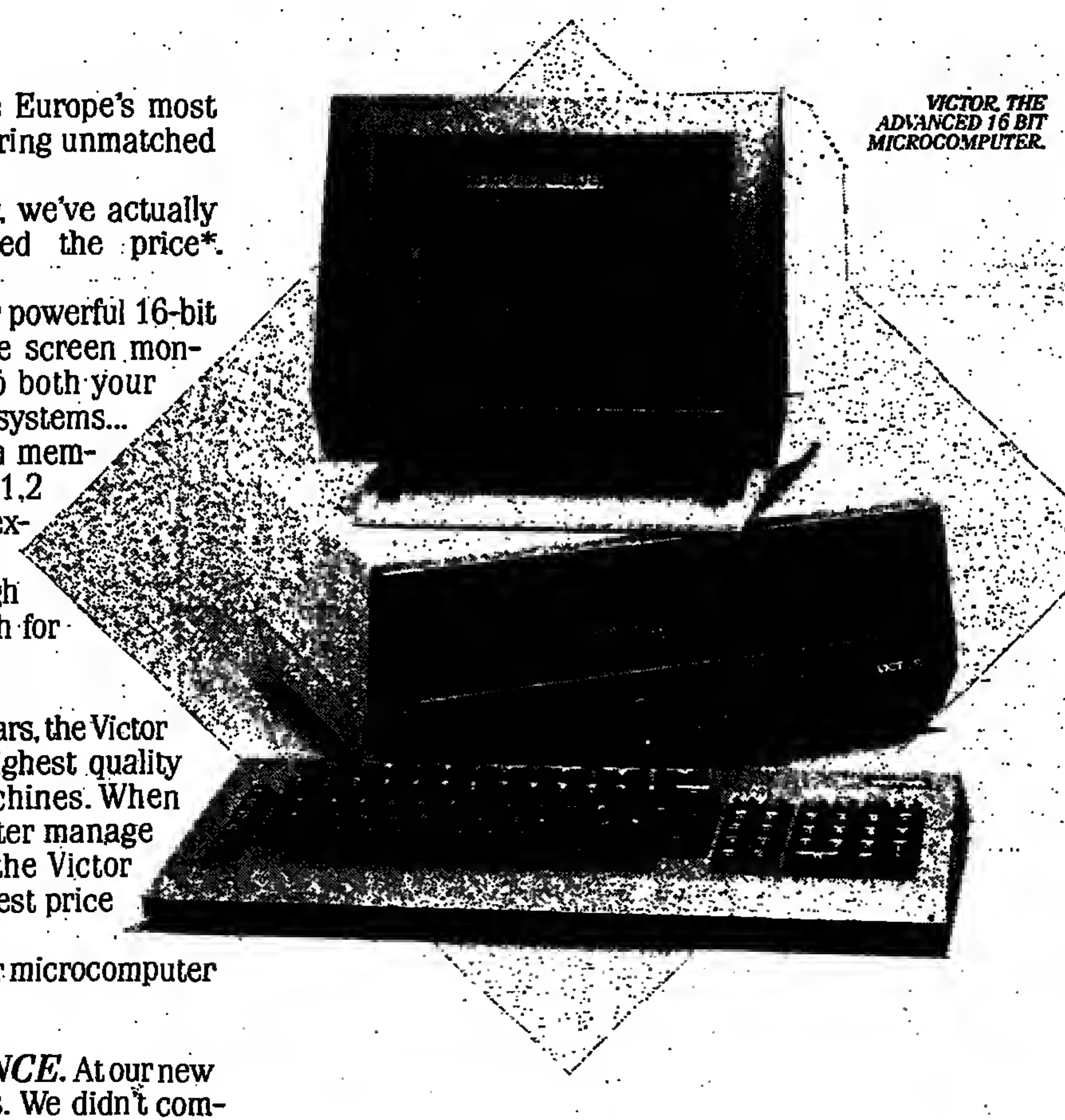
BY JEREMY STONE

LLOYDS BANK is to merge the money market activities of its wholly-owned Labco subsidiary with those of the parent bank, creating a new money market division. Labco provides a range of banking services, its main function being the placing and taking of sterling deposits and arranging of short and medium term sterling loans.

From today all new sterling deposits will be taken by the new division in the name of Lloyds Bank, while existing deposites and loans with Labco will continue to run until maturity. Labco will keep its seats on the London International Financial Futures Exchange (Liffe) and will continue to operate in the future market on behalf of Lloyds and its customers.

Mr. John Davis, chief general manager of Lloyds, said the benefit to the bank of keeping up a separate sterling dealing facility were diminishing. "The amalgamation will bring significant advantages in the more efficient use of resources and in the coordination of the bank's treasury operations.

During the ten years of Labco's existence the parent bank has turned round from being a net provider of interbank liquidity to a position to a substantial degree from interbank borrowing.



PRIVATE SECTOR WILL SUPPLY RAILWAY EQUIPMENT

BR widens buying policy

BY HAZEL DUFFY, TRANSPORT CORRESPONDENT

BRITISH RAIL has introduced a new policy which will lead to the private sector supplying major equipment, such as locomotives for the first time in nearly 20 years. The policy has been devised following Government pressure on BR to give the private sector a better chance to compete, and also because the BR Board wants to push its subsidiary, BR Engineering, into becoming more internationally competitive in rail equipment at a time when long-term prospects for domestic work are poor.

The policy has been introduced while BR is still talking with the trade unions about proposals to cut the engineering workforce by 3,500 by the end of next year. In spite of the sensitivity of the BR engineering workshop closure proposals, BR recently placed two orders for a prototype medium density diesel multiple unit (DMU) – one with BR Engineering at Derby, and the other with Metro-Cammell in Birmingham – which is expected to form the basis of BR's DMU reordering programme.

BR has also recently sent a specification to Brush (part of Hawker Siddeley) and GEC detailing its requirements for a new 125 mile per hour locomotive. The locomotive would be suitable for hauling trains on the East Coast main line, if this is electrified. BR has told the unions that it does not have the design capability at head office for the new locomotive, hence, its decision to go to the private sector. If the move results in orders being placed, they will be the first locomotives to be built outside BR since the late 1960s, with the exception of 30 freight locomotives built in Romania during the 1970s.

The BR board has made it clear to BR Engineering and the unions that it will have to win more export orders, if it is to survive. BR Engineering has only competed for overseas' work in the past two or three years as the decline in BR's own requirements had its effect on the workload. It has had some successes – most notably in the Congo recently – but the international market for rail equipment is extremely competitive.

If the closures of most of the workshops at Shildon, Co Durham, Horwich (near Bolton), and Temple Mills in East London go ahead, BR Engineering's workforce will be down to 31,000, of whom about half are employed on maintenance and the others on new build. This will still leave BR Engineering one of the largest engineering employers

The whole relationship between BR and its engineering subsidiary was examined in the recently published Serpell Report on the UK rail system. Although BR Engineering operates at arm's length from BR, Serpell identifies several areas where the relationship needs sharpening. One possibility being considered by the Government is for parts of BR Engineering to be transferred to the private sector, but absorption back into the BR board is also being considered.

Steel industry will challenge flourishing scrap iron exporters

BY PETER BRUCE

THE rapidly expanding export business of Britain's scrap metal merchants is being challenged by the steel industry.

The British Steel Corporation (BSC) and the British Independent Steel Producers' Association are reported to be about to ask the European Commission to restrict exports of scrap to third countries.

Pressure to curb exports of British and other European ferrous scrap has followed a dramatic improvement in scrap prices. Prime scrap steel is selling for roughly £50 a tonne, compared with £25 a tonne last November.

The scrap industry, however, is unlikely to take an attack on its export trade lying down.

For instance, the reports of pressure from the steel industry coincide with plans by Coopers (Metals), the UK's biggest scrap exporter, to announce next week that it is merging its export business in the North East of England with a smaller operation, Robinson and Hannon, a company run by the president of the British Scrap Federation.

Poor domestic demand for three years has transformed Britain's scrap trade. Merchants have seen their numbers dwindle by more than 200, to between 400 and 500.

Four years ago Britain's ferrous scrap merchants could comfortably count on selling some 80 per cent of their iron and steel scrap in the UK. Because of the recession, about 50 per cent of UK scrap, worth £140m, was exported last year.

The industry's three main domestic customers – BSC, private steelmakers and the foundry industry – have been sharply trimmed during the recession.

These three groups last year bought roughly 1.5m tonnes of scrap each, with BSC, chiefly its special steels group, remaining the biggest single consumer.

BSC has all but lost the influence it had on scrap prices 10 years ago. Although there was a time, towards the end of last year, when scrap consumers managed to force the price of prime ferrous scrap down to about £25 a tonne, the merchants are now able to insist that BSC follows the improved European continental prices.

Survey reports serious skilled labour shortages

BY ALAN PIKE, INDUSTRIAL CORRESPONDENT

SKILLED LABOUR shortages continue to be reported by more than a quarter of employers despite high unemployment levels, according to a survey conducted by Manpower, the temporary services company.

Inquiries among 1,189 employers found 27 per cent reporting skill shortages, with industrial workers the most in demand.

The area which suffers most from skill shortages is the hotel and catering sector – accounting for 43 per cent of employers – where there is a large seasonal element in the demand for labour.

Other areas of substantial shortage include the clothing, textiles and electrical engineering sectors. The survey says that 32 per cent of local government departments also reported shortages of skilled labour, particularly in technical areas.

The sectors with fewest skill shortage problems were banking, insurance, food and drink manufacture and road haulage.

The regions with the greatest skill shortages were London and the North West, where 37 per cent of employers reported difficulties, and the East Midlands with 35 per cent.

One surprising result of the survey shows that, despite an acute youth unemployment problem, 40 per cent of the companies interviewed claim to be short of junior and trainee staff. Sectors reporting particular shortages of junior staff included banking, retailing, clothing manufacturing, vehicles and textiles.

A Manpower survey of employment prospects suggests that 21 per cent of employers expect to increase their staff by the end of June, compared with 13 per cent in the previous quarter and 14 per cent in the corresponding quarter last year. Staff decreases are forecast by 14 per cent.

● The staffs of the English clearing banks started to grow again last year after a dip in 1981, prompting banks to attack as nonsense union claims that new technology is having a major impact on employment levels.

Figures from the Committee of London Clearing Bankers show that the staffs of Barclays, National Westminster, Lloyds, Midland, Williams and Glyn's and Coutts grew by 4,400 to 235,500.

This compares with a drop of 6,500 in 1981, after 20 years of growth which saw staff numbers double from their 110,000 level in 1960.

Banks argue that the 1981 figure was a hiccup to compensate for over-recruitment the year before, when existing staff began to hold on to their jobs in unexpected numbers because of the recession.

The long-term trend is continued slow growth, according to the banks. Some managers put the underlying staff growth rate at 1 to 2 per cent a year, compared with a 7 per cent growth in business. The gap is accounted for by increased efficiency, including new technology.

Mr Terry Molloy, deputy general secretary of the 150,000-member Banking Insurance and Finance Union (Bifu), accuses the banks of being unduly complacent about the impact of technology.

Staff numbers were still 2,000 below those of two years ago. He said: "I have no doubt at all that the reduction in the staffing levels was a result of new technology."

Bifu is seeking new technology agreements which give it substantial negotiating rights to influence the pace and manner in which new equipment is introduced.

Brokers optimistic about prospects for economic recovery

BY ROBIN PAULEY

THE APPARENT strength of the start of the British economic recovery, boosted by falling all prices, lower than expected inflation and a lower sterling exchange rate, has led economists at two leading brokers to be more optimistic about prospects for 1983.

James Capel now expects growth of 1.8 per cent during this year and a rise in activity of 2.7 per cent in 1984. "We now expect a more balanced and sustainable economic recovery over the next 18 months led by export and investment growth," they say.

Sterling's fall should be fully reflected in a 17 per cent improvement in UK competitiveness, the main impact on economic growth being felt in the last half of 1983 and first half of 1984.

Exports should begin to benefit from sterling's slide and a sharp recovery in world trade in the second half of this year. The sharp fall in sterling and consequent rise in import prices should help to "choke off" import volumes and reduce potential import penetration in 1984.

Capel-Cure Myers says the inflation and sterling levels have been instrumental in causing them to revise their growth forecast for 1983 from 1.5 per cent to 2 per cent. However, they are more pessimistic about 1984, for which they say there are grave dangers. If world growth proved strong then export growth could be enough to sustain the UK economy. "But it will need to be vigorous to achieve this. Otherwise, as consumer spending falters, the stock cycle could compound the difficulties, hence disappointing recovery hopes once again," they say.

● Prospects for industrial recovery in London and the South East have improved, with domestic and export orders and production levels all rising according to the London Chamber of Commerce and Industry.

The provisional results of its latest trend survey of manufacturing industry in London and the South East also highlight a substantial improvement in investment intentions throughout the region.

The rapid fall in the balance on past year's survey means the balance of plus 7 per cent is higher than that reported in the July and December surveys.

GEC may buy back Welsh TV factory

BY ROBIN REEVES, WELSH CORRESPONDENT

GEC IS considering the possibility of buying back the South Wales television plant which it once owned but which, for the past four years, has been run as a joint venture with Hitachi of Japan.

News of the possible British repurchase emerged as 1,200 workers at the factory, at Hirwaun, near Aberdare, rejected a peace formula designed to cushion what amounts to a cut in pay. All production from the factory is expected to cease as a result of the dispute.

The local management is insisting on a wages freeze for the third year running and changes in a bonus plan which would reduce the pay of semiskilled production workers from around £91 to £84 a week. It also wants to contract out the manufacture of certain components and factory services.

Discussions on GEC's possible buyout of Hitachi's 50 per cent share in the company are understood to be due to take place this week. GEC has declined to comment, saying only that it held regular meetings with Hitachi about the jointly owned business.

GEC-Hitachi is the only surviving Anglo-Japanese joint venture in television manufacture. A comparable arrangement between Rank and Toshiba was wound up two years ago and the assets were subsequently taken over by Toshiba alone.

GEC's practical involvement in the day to day running of the Hirwaun plant has been strengthened within the past two months by the appointment of Mr Graham Williams of GEC as managing director, in place of Mr S. Okuma of Hitachi.

Last year the plant was forced on to short time working for a period and then announced more than 800 redundancies as part of a package of measures aimed at cutting production costs by 25 per cent. The plant has the capacity to produce 250,000 to 300,000 colour TV sets a year.

Three cases of derailed legislation

BY A. H. HERMANN, Legal Correspondent

IF YOU are thinking of confining your files to the memory of a computer or word processor, stop and consider the implications of the Data Protection Bill which is likely to receive its second reading in the House of Commons shortly.

Passed in its present form and interpreted strictly, this piece of legislation would oblige you to disclose to those concerned whatever was in your computer's memory. You would have to register, and the Registrar, to be appointed for controlling the operation of the Act, would have the power to withdraw the registration without notice, and impose unspecified fines on you. If an error slipped into your electronic memory, you would be liable for damages to any person who suffered by it, even if you were in no way to blame, but you would not be so liable had the error remained recorded in black and white on your files.

This, as well as other horrors, emerges from an article* by Clive Rumbelow, solicitor and chairman of the International Bar Association's committee on computer law. If the consequences of the proposed legislation are only half as bad as Mr Rumbelow assumes, it ought to be quickly returned for re-drafting.

The legislation is designed to enable the Government to ratify the "European Convention For The Protection of Individuals With Regard To The Automatic Processing Of Personal Data." It is very doubtful that the European Convention was intended to apply to ordinary business processing of information, right down to newsagents' addresses of customers, solicitors' files, medical records, and servicing of domestic appliances, such as central heating and television sets. Unfortunately, the text of the Bill, in combination with the literal method of interpretation, is likely to have such effect.

Mr Rumbelow suggests that this unfortunate piece of legislation could be saved by deleting from it Part II which deals with registration. Unless the Convention can be altered, the Government is committed to a very wide definition of "personal data" which would make registration extensive and onerous. Almost every business and organisation could be a personal data user, and yellow pages would be a better and less costly starting point for the Registrar.

On the other hand, the Convention does not require the introduction of a registration system. "With the registration provisions could also go all powers of the Registrar to put people out of business . . ." writes Mr Rumbelow, and proposes that enforcement of data protection should be left to the courts in the ordinary way. The correction of inaccurate personal data could be obtained in the same way as was staked out in the Consumer Credit Act with regard to credit reference agencies.

* * *

While the Government displays a somewhat excessive zeal over data protection legislation, it seems to be entirely lacking any enthusiasm for a short but most necessary Bill which would extend the use of trademarks to services. The Bill, piloted through the House of Lords by Lord Campbell of Alloway, was introduced in the House of Commons by Mr Stephen Dorrell and is listed for a second reading on May 20. In the Lords it received support from all sides, but not from the Government, so the fate of the second reading remains uncertain.

Trademarks for services can be registered in many European countries, and are also provided for in the proposed Community trademark regulation. The extension of British trademark law to services was recommended by a departmental committee in 1973. The need was also recognised by the House of Lords Select Committee on the European Communities when it considered the Community trademark.†

Presenting the report of this Committee to the House, Lord Scarman said that the lack of provision for service trademarks was "a very serious omission in our law." The Government now argues that amendments which it hopes to achieve in the Community trademark proposals will be enough to remove this UK disadvantage, but the main reason seems to be that the Trademarks Registry cannot cope with applications, even without service trademarks.

Without the possibility of registering a trademark, service enterprises can protect their names only by the common law means of a passing-off action, which is difficult, expensive and time-consuming. Small businesses can hardly afford such a costly move, and it is not available to new businesses at all. This makes the negative attitude of a Government, which is supposedly friendly to small and new enterprises, difficult to comprehend, particularly as the Trademarks Registry is a profitable operation and could easily be expanded by the hiring of temporary staff.

* * *

I know a very successful female journalist who started as a tea-girl, but in Germany where there is only one trade union for each industry, British trade union barriers make redeployment of workers difficult, and the best utilisation of talent impossible.

Legislation which would give women a claim to equal pay with men doing work of equal value would not entirely remove the disadvantage (to women and to society) but would help. Yet legislation introduced by the Government to comply with a European Court judgment‡ leaves one wondering whether it is not designed to defeat, rather than to promote the principle of equal pay for work of equal value.

The legislation takes the form of an Order under the European Communities Act 1972 instead of the expected Amendment to the Equal Pay Act 1970. In this way, the Government will avoid amendments and consideration of the Bill in committee. Debate in the House of Commons will be restricted to 90 minutes.

Yet if I read the draft order§ correctly (and this is by no means easy), it is badly in need of amendment to achieve its purpose. It excludes claims from work places which have a job evaluation scheme, no matter how old or sex-biased. When the claim may be brought the industrial tribunal can reject it out of hand because it thinks it unreasonable. But it can allow the claim only on the basis of the report of an expert.

Moreover, sex discrimination has to be proved by the applicant—an impossible task in most cases. Those who still dare to go ahead may be warned by the tribunal that certain costs may be awarded against them. To make things still more difficult, those who start with the argument that they do the same or similar work as a man who is better paid and fail in their claim, will not be able to continue with the subsidiary argument that, if not similar, their work is at least of equal value.

Do not blame the parliamentary draftsmen. Women face a much more powerful conspiracy.

The Government pushes the Data Protection Bill too far and a trademark for services too little, while it puts equal pay into reverse gear

*The Law Society Gazette, March 2 1983, p538.
†ISBN 0 10 402183 7, November 16 1982.
‡EEC Commission v UK, Case 61/81, judgment July 6 1982. FT: July 15 1982. FT ELL: July 1982.
§The Equal Pay (Amendment) Regulations 1983 laid before Parliament in draft.

Freeports 'will be no overnight success'

By Anthony Moreton

THE LOCATION of Britain's first freeports should be dictated by commercial considerations rather than political factors, Mr Ken O'Brien, chief executive of Rush and Tompkins, told a London conference.

The Chancellor of the Exchequer gave the go-ahead for the establishment of the first British freeports in last month's budget statement.

The locations of several freeports – small secured areas, treated as being outside the customs frontiers of the host country, where goods can be temporarily stored, manufactured or processed free of customs duty – are expected to be named by the Government later this year.

Mr O'Brien told the conference, organised by the Adam Smith Institute, that it would be wrong to expect immediate success for freeports. It had taken 50 years to get the experiment right in the U.S., and Britain should not expect to see overnight success.

Another important factor was convenience. "Don't be blinded by tariffs. Make it easy for people to use freeports and the chances of success will be enhanced."

Rush & Tompkins is one of the few British companies with practical experience of how freeports operate in the U.S. The company holds a 46 per cent stake and manages the Delaware Valley Foreign Trade Zone in Philadelphia.

Dr. Madsen Pirie of the Institute, welcomed the Chancellor's decision since "freeports are areas of freedom where unfettered enterprise shows what can be done without government regulation."

WE HAVE TRIED TO BE FAIR, SAYS PENTAGON

British prospects bleak in the struggle for Trident contracts

BY BRIDGET BLOOM, DEFENCE CORRESPONDENT

WHEN the Government announced a year ago that Britain would spend £7bn to £10bn on buying the U.S. Trident missile system as the UK's next generation nuclear deterrent, it tried to sweeten the controversial deal by offering British companies the chance to compete for contracts in the much larger U.S. Trident missile programme.

Officials were then and still are unwilling to put figures on what could be at stake. About 45 per cent of the £7.5bn Britain is scheduled to spend (at 1981 prices) on Trident will be in dollars. The ultimate size of the U.S. programme is not yet determined but, with some 20 submarines each carrying 24 missiles against Britain's planned four boats with a probable 16 missiles each, the U.S. programme is obviously much bigger than Britain's.

Thus, there will be very substantial business for defence industries. But what share might come to Britain? In a few months' time a preliminary answer can be given.

For if, by the summer, British companies have not been accepted as potential sub-contractors by the seven main U.S. prime contractors (long since appointed) then (officials on both sides of the Atlantic agree) they will stand no chance of getting contracts once the Trident programme enters full scale engineering development at the turn of the year.

"We've moved heaven and earth to make sure British companies can compete on an equal basis," a senior Pentagon official said in an interview in Washington last month. "Now its up to them."

An official in the special Trident office in the Ministry of Defence in London emphasises the special measures which have been taken over the last year to encourage British companies to compete for business.

These measures began with a briefing in London by Pentagon officials at the height of the Falklands war last May. Several U.S. contractors, including Lockheed, Sperry and Rockwell have also briefed companies in the UK. Bureaucracy has been reduced to allow more than 70 companies to visit the U.S., and regulations waived to make it easier for British companies to meet stringent U.S. procedures for registration with American prime contractors.

Mr Robin Heiser, who runs the small Trident office in the Ministry of Defence, said 153 British companies were qualified, or probably sooo would be, to compete for U.S. sub-contracts. But that is a preliminary – if essential – stage to winning bigger business.

Ministry and Pentagon officials praise the joint agreement on Trident, but they cannot hide that it is strictly limited. It is not an "offset" deal, unlike in the 1960s when British companies were guaranteed some $700m of business in return for British aircraft purchases from the U.S.

This time there is no guarantee of any major business coming Britain's way and the Government has been criticised by industry for not achieving anything more than a U.S. agreement to spend £150m to buy British Aerospace's Rapier missile to defend U.S. airbases in Britain.

Britain is buying between 70–100 Trident II (or D5) missiles and their associated control and guidance systems from the U.S. The deal is, therefore, simply that British companies can "compete on the same terms as U.S. companies for sub-contracts for the Trident II weapon system and components for the programme as a whole."

The competition does not extend to the submarines from which the missiles will be fired.

How do British companies rate their chances of winning business? Very dismally according to a straw poll this week of senior executives of both small and larger companies.

Three key problems highlighted by Mr David Gilbert, managing director of Hunting Engineering, were echoed by others in the industry.

- The Trident II programme, based on the existing Trident I programme, is sufficiently advanced for most sub-contractors to have been effectively designated already.
- Competition for remaining contracts is such that only companies with very special skills or products have a chance of competing.
- That chance will be enhanced if the company is already well known to a U.S. prime contractor.

Few executives are hopeful. Many are downright pessimistic. "I don't think there's a hope in hell of getting anything worthwhile," said the marketing director of one high technology communications company.

So far there is little to show for the agreement. The only contract directly attributed by the Ministry to the Trident deal is worth some £4,000. Sterling Metals have supplied an aluminium investment casting for testing in the gyro for the missile's guidance system. Mr Heiser at the Ministry and the company both hope, however, that this will be "the thin end of the wedge."

How Baxters stirs the soup on the banks of the River Spey

Mark Meredith reports on the making and marketing of a better class of groceries

DECISIONS THAT have stirred the soup market in Britain have often been made in a hut on the banks of the River Spey in north-east Scotland.

During a break in a day's salmon fishing on this preserve of the wealthy, Mr Gordon Baxter will adjourn to the hut of supermarket or hotel for relaxed negotiations over a dram of single malt about bulk orders for canned cream of smoked trout soup, tinned sauces, or perhaps vintage marmalade.

To disarm the world-weary trader, leaping salmon, venison, grouse, country cooking, fresh air, Scotland and things healthy become positive assets when sold by the genial 65-year-old, a prominent member of the village Episcopalian church and grandson of the local grocer.

Baxters of Speyside trade successfully on being the antithesis of the anonymous big city corporation.

In spite of more than 100 takeover offers, fast growth, a £15m turnover and profits this year of about £1m, Baxters remains very much a private company.

Preserving family history in aspic in the best American style, grandfather George Baxter's grocery shop has been reconstructed in the factory grounds near Fochabers in Grampian.

Baxters has secured and is improving on a 5 per cent share of the UK soup market at a time when the British consume less soup.

Two ranges of soups, one at the upper end of the general consumer market and another at the top of the "special occasion" soups market such as pheasant consommé and [illegible] business ahead of jams, sauces and pies. Soup production has increased 40 per cent in volume over the past three years.

Working in the company's favour during a recession has been its small size, fast market responsiveness, a tight circle of decision-makers and a flexibility which big corporations cannot match.

"At a time when companies are adjusting to higher levels of unemployment, we have sold to the people who are employed and earning more money," says Mr Keith Jamieson, Baxter's managing director, hired from Associated British Foods.

Soup-sipping is down 10 per cent from 1976. A maturing population means a more mature taste-consciousness and less demand for large volume brands of soups such as tomato and chicken noodle.

Developments like these are more likely to harm a company the size of Heinz, with an estimated 55 per cent market share, says Mr Jamieson.

He feels the market has changed more in five years than in the previous 15. Big multiple stores are fashionable and about 30,000 local grocery shops have disappeared in the past six years.

Producers adjusting to consumers with less disposable income have moved downmarket into generics and lower products leaving open the top end of the market.

Fresh and frozen goods are making inroads on long life foods like those in cans. But restaurant business is suffering as well. More people stay at home to eat and there is a [illegible] variety in the kitchen.

From the hygienic tasting rooms about 40 new products have been approved in the past [illegible] for the [illegible] to probe the market [illegible] home, and the [illegible] meal at [illegible] and airline market. [illegible] hotel "TWA today are [illegible] cream of smoked trout on the way out and cream of asparagus on the way back," Mr Baxter notes.

Today's soups, sauces or jams are tested regularly against the market batch agreed on by this tasting Politburo. Tasters move into small cubicles to ensure objectivity.

Baxters was recently split up with two separate subsidiaries to market game pies to the £2bn a year pub food trade and "The Best of Scotland," a pilot plan to distribute breakfast table size pots of jams and marmalades for the catering trade.

What is not discussed much at Baxters is the inevitable problem with big family companies—succession.

Mr Gordon Baxter's eldest son, Andrew, 25, works in the company but is not a director. Mr Baxter himself maintains an active interest, and the day-to-day running of the company is carried out by Baxters of Speyside under Mr Jamieson. Non-executive directors on the board such as Sir Jan Lewando, formerly export director of Marks and Spencer, have a watching brief to ensure the family character of the company stays.

BASE LENDING RATES

A.B.N. Bank	10½%	■ Guinness Mahon	10½%
Al Baraka International	10½%	■ Hambros Bank	10½%
Allied Irish Bank	10½%	Heritable & Gen. Trust	10½%
Amro Bank	10½%	■ Hill Samuel	§10½%
Henry Anshacher	10½%	C. Hoare & Co.	†10½%
Arbuthnot Latham	10½%	Hongkoog & Shanghai	10½%
Armco Trust Ltd.	10½%	Kingsnorth Trust Ltd.	12 %
Associates Cap. Corp	11 %	Knowsley & Co. Ltd.	11 %
Banco de Bilbao	10½%	Lloyds Bank	10½%
Bank Hapoalim BM	10½%	Mallinhall Limited	10½%
BCCI	10½%	Edward Manson & Co.	11½%
Bank of Ireland	10½%	Midland Bank	10½%
Bank Leumi (UK) plc	10½%	■ Morgan Grenfell	10½%
Bank of Cyprus	10½%	National Westminster	10½%
Bank Street Sec. Ltd.	10½%	Norwich Gen. Tst.	10½%
Banque Belge Ltd.	10½%	P. S. Refson & Co.	10½%
Banque du Rhone	11½%	Roxburghe Guarantee	11 %
Barclays Bank	10½%	Royal Trust Co. Canada	10½%
Beneficial Trust Ltd.	11½%	Slavenburg's Bank	10½%
Bremar Holdings Ltd.	11½%	Standard Chartered	‖10½%
Brit. Bank of Mid. East	10½%	Trade Dev. Bank	10½%
■ Brown Shipley	10½%	Trustee Savings Bank	10½%
Canada Parm't Trust	11 %	TCB	10½%
Castle Court Trust Ltd.	11 %	United Bank of Kuwait	10½%
Cayzer Ltd.	10½%	Volkskas Intl. Ltd.	10½%
Cedar Holdings	11 %	Westpac Banking Corp.	10½%
■ Charterhouse Japhet	10½%	Whiteaway Laidlaw	11 %
Choulartons	11½%	Williams & Glyn's	10½%
Citibank Savings	¶10 %	Wintrust Secs. Ltd.	10½%
Clydesdale Bank	10½%	Yorkshire Bank	10½%
C. E. Coates	11 %		
Comm. Bk. of N. East	10½%		
Consolidated Credits	10½%		
Co-operative Bank	*10½%		
The Cyprus Popular Bk.	10½%		
Duncan Lawrie	10½%		
E. T. Trust	11 %		
Exeter Trust Ltd.	11½%		
First Nat. Fin. Corp.	12 %		
First Nat. Secs. Ltd.	13 %		
Robert Fraser	11½%		
Grindlays Bank	‡10½%		

■ Members of the Accepting Houses Committee.
* 7-day deposits 7.5%, 1-month 7.75%. Short-term £8,000/12-months 10.1%.
† 7-day deposits on sums of: under £10,000 7½%, £10,000 up to £50,000 8¼%, £50,000 and over 9%.
‡ Call deposits £1,000 and over 7½%.
‖ 21-day deposits over £1,000 8½%.
§ Demand deposits 7½%.
¶ Mortgage base rate.

APPOINTMENTS

Barclays designates treasurer

Mr Ronald Ball, at present deputy treasurer, has been appointed treasurer of BARCLAYS BANK from July 11. Mr John Burnside, at present assistant local director for Barclay's Preston district, has been appointed assistant general manager of the bank's group property division from April 15.

Mr J.A. Griffiths has been appointed to the board of INITIAL, in the newly created position of finance director. He was group comptroller.

Mr Graham Wilson has been appointed managing director of LEECH LEISURE, part of the William Leech Group. He was general manager.

Miss Janet E. Watson has been appointed vice-president, Eurobond sales, by SALOMON BROTHERS INTERNATIONAL in London. She was formerly with the London office of Credit Suisse First Boston.

Mr John Radclyffe has been appointed chief financial officer, worldwide retailing (ex. U.S. and Africa) by JARDINE INSURANCE BROKERS. He was in the financial services division of Great Universal Stores.

Mr John Earl has been appointed managing director of HADEN DRYSYS INTERNATIONAL, industrial fishing and mechanical handling division of Haden. He joins from Lummus, where he was director of operations.

Mr Gordon Hinnler, chairman of HILLARDS will retire from the board at the annual meeting in September when he will have reached the age of 70. Mr Peter Hartley, managing director, will become executive chairman, and Mr Bob Dowds, retail director will be appointed managing director.

Mr Colin Wyman has been appointed to the board of CHAMBERLAIN PHIPPS as finance director. Previously the company's investment manager, Mr Wyman takes over from Mr Brian Chamberlain who continues as chief executive.

Mr Christopher A. Bloomfield, Mr Robin C. Holliday and Mr Robert L. John have been appointed to the board of COUNTY BANK.

Four new partners are joining GRIEVESON GRANT AND CO., stockbrokers. They are Mr Ashley-Bunn, Mr V. G. D. Halls, Mr M. A. Harman, Mr R. Helyar and Mr P. B. Saunders. Mr G.H. Willett and Mr E. Beckhurst are retiring.

Sir Donald Barron, chairman of Midland Bank, has been appointed chairman of THE CITY COMMUNICATIONS CENTRE, an information and liaison unit set up by City institutions in 1978. He succeeds Mr Timothy Bevan, chairman of Barclays bank, who has relinquished his post with the centre following his recent appointment as chairman of the Committee of London Clearing Bankers.

Mr Gordon Peake has joined REDIFFUSION COMPUTERS as board technology director. He was with Computervision as support manager for Europe, and has worked with ICL, IBM and Honeywell.

Mr Ron Dearing, chairman of the Post Office, has been elected to serve as group chairman of the NATIONALISED INDUSTRIES' CHAIRMEN'S GROUP for 1983-84. Mr Norman Payne, chairman of the British Airports Authority, who was group chairman of NICG for 1982-83, becomes past chairman for the coming year.

Mr David Waine, BBC regional television manager, south west (Plymouth) has been appointed head of BBC network production centre, Pebble Mill, from May 31.

Mr Richard Ouston has been appointed to the new post of commercial director of VIKING POLYPROPYLENE, subsidiary of the Sevon Holdings Group. He was sales administration manager.

From March 31 Mr P. Langley-Essen, general manager of the NEWCASTLE BUILDING SOCIETY, will become chief general manager. He has been chief executive since the formation of the society in July 1980, following the merger of the Grainger and Newcastle Permanent Building Societies. Mr E. A. Cowan, currently deputy general manager, will become general manager.

Mr D.W. Midgley, currently assistant manager (development), will become deputy general manager. Mr L.B. Cowan, currently general manager. Mr B. Garnon continues as secretary.

From July 1 Mr Rex M. Fleet, chairman and managing director of NCR UK, will be appointed vice president, financial systems division of the U.S. marketing organisation, and will be based in Dayton, Ohio. Succeeding him will be Mr Frederick Newall, who will be appointed chairman and managing director of NCR UK. Since August 1982 he has been executive assistant to the chairman and president of NCR Corp. in Dayton.

Mr David C. Samworth has been appointed a non-executive director of the IMPERIAL GROUP. He is currently chairman of the Meat and Livestock Commission.

Mr Peter Simonis has joined the board of THE MORGAN CRUCIBLE Co. He is chairman of Haden.

Mr Ronald N. Waxman has been appointed finance director of BLACK ARROW GROUP. He continues as company secretary.

Mr John S. Rohan has resigned as chairman of ROHAN GROUP. He moves to Los Angeles to establish Rohan California Investments Inc., of which he has been appointed chief executive. He will become vice-chairman of Rohan Group and Mr Kenneth C. Rohan will become chairman and continue as chief executive.

Mr David J. Smith has been appointed to the board of AITKEN HUME. Mr Smith has, until recently, been based in Washington DC, where he was with IFC, the private sector arm of the World Bank. Before that, he was a manager and senior banking executive with Lazard Brothers and Co.

Mr A.M.A. Parker, Mr N.H. Bubb, Mr C.J. Ring, Mr I.C. Buckley and Mr N.P. Chamberlain will be joining the partnership of SCRIMGEOUR, KEMP-GEE AND CO., stockbrokers, on April 11.

WOOLWICH EQUITABLE BUILDING SOCIETY has made the following appointments: Two general managers, Mr David Small (corporate planning) and Mr Michael Tuke (finance), have been appointed. Mr W. E. Clarke, general manager (finance), becomes general manager (administration). Assistant general manager, Mr A. I. S. McKiddie succeeds Mr Tuke as secretary and the society's chief internal auditor. Mr Stanley Cummings, has been appointed an assistant general manager. Mr Peter Beeke has his post extended and is re-titled assistant general manager (management services).

Mr H. H. Scurfield, NORWICH UNION INSURANCE GROUP'S general manager and secretary, is taking over as general manager and actuary of the Norwich Union Life Insurance Society from July 1. He replaces Mr V. W. Hughff who will be concentrating on his duties as deputy chief general manager of the Norwich Union Insurance Group. Mr D. P. Lister, assistant general manager (data processing) becomes general manager and secretary, Norwich Union Insurance Group. Mr A. Bridgewater, assistant general manager (staff), is to be deputy general manager of the Norwich Union Fire Insurance Society from July 1. Mr A. G. Mills, underwriting manager (life), is to be assistant general manager (data processing) from July 1, and Mr P. O. Sheridan, home fire manager, is to be assistant general manager (staff). Mr E. J. Brister, the group's planning manager, is to be underwriting manager (life), and Mr R. A. Cobb, assistant home fire manager, is to be home fire manager from July 1.

Mr Ross Wheeler has been appointed director and general manager of the RADIO RENTALS cable operation and Mr Stanley Bell has been appointed technical director from April 1. Mr Wheeler was regional controller west region. Mr Bell has been associated with the cable operations of Radio Rentals, particularly in Swindon and the Medway Towns. Mr Michael Thomas, area manager, Yorkshire, has been promoted to regional controller in succession to Mr Wheeler.

STEAD & SIMPSON has made Mr W. R. F. Chamberlain a non-executive director from April 1. Since 1972 Mr Chamberlain has been chairman of Chamberlain Phipps

Mr G. R. Parker has been co-opted to the board of CROWN HOUSE. Mr Parker is managing director of the engineering contracting division of the Crown House group. Subject to his election at the annual meeting, Mr Parker will be appointed group chief executive on October 10. On July 1 Mr B. C. Boyes will be appointed managing director (formerly north region director) of Crown House Engineering Limited and Mr A. F. Eyre will be appointed managing director (formerly deputy managing director) of Crown House Engineering International. Mr Parker will remain on the boards of both these companies.

DAVIES & NEWMAN has appointed three directors: Mr Thomas S. Farrell, manager of the Shellhaven tanker agency. Mr John M. Dwane and Mr David L. Blight, tanker chartering brokers.

FIELDING & PARTNERS (AVIATION) has appointed Mr R. W. Fielding, Mr A. J. Money Mr P. J. Stephens and Mr R. C. Weston as directors of the newly formed company.

Mr Christopher Wilson, chairman and managing director of NORTHERN COUNTIES NEWSPAPERS, whose retirement becomes effective April 1984, is to relinquish his position of managing director. Mr Tony Boore, managing director designate, becomes managing director of NCN, on April 1. Mr Wilson is to continue as chairman.

THE STERLING BROKERS ASSOCIATION has appointed the following officers: Mr M. J. Warren, of M. W. Marshall (Sterling), chairman, Mr M. G. Redgwell, of Butler Till, deputy chairman, Mr N. R. Blows, of Harlow, Meyer Savage, secretary and Mrs A. M. P. Howorth, of Packshaw and Co., treasurer.

Dr Aodh O'Dochartaigh has been appointed director of ICL's consultancy and training services division in addition to his present duties as director of the DNX division

Mr Keith R. Greenwell has become managing director of the WORCESTER ROYAL PORCELAIN CO. Mr Greenwell has been involved with the Royal Worcester Spode Group as a management consultant for five years.

Mr John D. Castleman has been appointed chairman of TOWN AND COUNTY BUILDING SOCIETY in succession to Mr Eric Price Holmes, who has retired. Mr Castleman has been a deputy chairman of the society. Mr F. V. Dale and Mr Reginald Woolgar have been appointed joint deputy chairmen.

Dr Stuart L. Balsky has been named manager of management planning and development in the corporate employee relations department of PPG INDUSTRIES. He had been manager of training and organisation development for chemicals operations.

WYLY CORPORATION has appointed Mr Gregory J. Liemandt chairman and chief executive officer of the corporation and its wholly-owned subsidiary University Computing Company from April 1. Mr Liemandt was chairman and president of General Electric Information Services Company (GEISCO) where he held a number of senior mangement positions from 1974 until his appointment as chairman in 1980.

Mr Donald O. Neddenriep has been appointed group vice-president of the product division of the computer system operation of SPERRY CORPORATION. Mr Neddenriep, vice-president and general manager of software products, takes over from Mr Paul J. Spillane, who is vice-president for manufacturing and technology

Mr Ladislaus von Hoffman has been appointed a director of MINORCO. He is president and chief executive officer of Consolidated Mining and Industries (Consolidated), the central holding company of the Hochschild Group. Consolidated holds 60 per cent and Minorco indirectly 10 per cent of Empresas Sudamericanas Consolidadas, an investment holding company with extensive interests in South America.

The CHICAGO BOARD OF TRADE has approved the promotion of Mr Frederick J. Grede to vice-president/secretary of the exchange, and Mr Delbert Heath, Jr. to vice-president/administrator of the Office of Investigations and Audits (OIA).

Among his other duties Mr Grede will serve as staff liaison to the board and the executive committee and to other member committees. Mr Heath will oversee the financial integrity of exchange members and assure member compliance with exchange rules and regulations.

U.S. Comptroller of the Currency has selected Mr H. Joe Selby as senior deputy comptroller for bank supervision. Mr Selby had previously been senior deputy comptroller for national operations. Mr Selby will be responsible for establishing all bank supervisory policies and practices, as well as policies affecting national banks requiring special supervisory attention. Mr Selby will continue to serve as a major member of the Policy Group, which advises the comptroller on major policy decisions.

CONTRACTS AND TENDERS

COMPANY NOTICES

BUILDING AND CIVIL ENGINEERING

STATE INTERVENTION

Labour plan under attack

THE CONSTRUCTION industry is fighting against Labour's plans for substantial state intervention in its business.

In a joint statement which sparks off a fresh round of skirmishing between the two old adversaries, the Federation of Civil Engineering Contractors and the National Federation of Building Trades Employers, say they are saddened to see the Labour Party "clinging to outdated proposals" for a nationalised construction company and for an expanded role for local authority direct labour building departments.

Labour's proposals, contained in "The New Hope For Britain," the party's General Election plan on which its manifesto will be based, have also provoked a new £1m campaign by Aims of Industry, with "generous" support from the construction industry.

The joint statement said: "On the one hand the Labour Party is proposing to 'begin a huge programme of construction so that we can start to build our way out of the slump.'

"On the other hand, they are proposing measures for substantial state intervention in the free enterprise construction industry which can only impair our capacity to respond to the sharply increased demands to be made on us."

The Federations said the Labour Party's policies were not new and the industries' total opposition to them was "clearly spelled out" before the last election.

Labour's plans for dramatic increases in spending, the Federations claimed, coupled with more state intervention, would inevitably lead to much higher building costs for both public and private clients and "ultimately fewer jobs."

Labour's proposals for extending public ownership into the construction industry include:

- The establishment of a National Construction Corporation, based on the acquisition of one or more major contractors, as a peacemaking public competitor in the national and regional construction market, or possibly through the creation of a major new company.
- Extension of the activities of local authority direct labour organisations or the creation of new ones.
- Encouragement and support from the Government for the development of workers' co-operatives at the "jobbing" end of the industry.
- Extension of public ownership into such sectors as glass, plaster, cement, bricks, tiles, sanitary equipment and other building materials industries, through the establishment of a holding company—the Building Materials Corporation—which would acquire a major stake in each of these sectors.

The National Council of Building Material Producers has attacked the latter proposal, promising to take appropriate steps to counter them.

Mr Nigel Chaldecott, BMP director general, said there were some companies in his sector which were monopolies, as defined by legislation, but various mechanisms supported by all Governments existed to ensure that the public interest was safeguarded. "These well-managed companies have a sound record of innovation and competitiveness, and are successful," he said. "They have to meet open competiton from alternative products and construction methods."

It was "more than difficult" to see how public monopolies or a public stake in such industries could be more successful, provide more employment and satisfy the public so well—without in any way calling on the public purse.

LISA WOOD

OVERSEAS CONTRACTS

£15m Barbados bank

HIGGS AND HILL CARIBBEAN, a subsidiary of Higgs and Hill, has been awarded a contract for the construction of the headquarters building for the Central Bank of Barbados in Bridgetown, Barbados. The building, valned at about £15m, will be built around a central courtyard providing natural light and ventilation. The public will have access to banking facilites on the ground floor and there will be a further nine floors of offices. Lifts, staircases and services will be housed within 12 towers, to be built of insitu concrete using "slip form" techniques. The towers, a striking architectural feature, support floors formed with steel beams and decking and the whole building will be clad with precast concrete panels.

Biggest painting order

HAT Group's industrial painting subsidiary JACK TIGHE has been awarded a seven-year £30m painting and maintenance contract for Brunei Shell Petroleum. The work, which covers over 200 offshore platforms in the South China Sea being used mainly for drilling, production and accommodation, will be handled through Tighe's subsidiary Q. A. F. Jack Tighe (Offshore) based in Brunei, with marine support vessels provided by Solus Ocean Systems Inc, Texas.

Homes to be made from straw in China

A Suffolk firm has signed a £1m contract with the People's Republic of China, who want to produce houses from rice and straw. Stowmarket - based STRAMIT INTERNATIONAL will supply and instal two factories in China to manufacture rigid building panels from waste rice and wheat straw, using the company's Stramit process The two factories near Peking should be producing early next year. The rice and wheat straw board is used to build low-cost homes.

Indonesian action stirs up a breeze

A FUTURE challenge to Singapore's dominant position in South East Asian commerce has moved a significant step forward with the recent completion of an airstrip on the Indonesian island of Batam.

Indonesia has long cast covetous eyes on Singapore's success as the industrial and trading fulcrum in the area and particularly, at the advantages offered to the state by its free-port status. As long as ten years ago Indonesia proposed the creation of its own Singapore on the island of Batam, just 20 kilometres away from the original across the Singapore Straits.

But the project was hampered both by the under-development and inaccessibility of the island and by a fall in Indonesia's earnings from oil and gas exports.

These problems still exist, but the project was revived at the end of the 1970's by Dr B. J. Habibie, Indonesia's Minister of Technology, who saw the potential for the Batam development against a background of increasing space shortage and rising labour costs in Singapore. Batam, be reasoned, could offer a new, low-cost location for labour intensive businesses at a time when Singapore is moving increasingly into low-labour content sectors like services and electronics.

As a result, the whole of Batam island is now designated a duty-free bonded warehouse, with major incentives offered to potential foreign investors. Fundamental to the programme, however, was the development of an infrastructure on the island, including roads, a major sea port and an airfield capable of handling inter-continental jets.

Although no final completion date was put on the overall project, the airfield was regarded as an essential prerequisite because of the island's inaccessibility. Any Indonesian wishing to get to the island had to travel for hours by ferry from the nearest island or fly to Singapore for the much shorter ferry journey from there to Batam.

Even so, the airstrip contract was not awarded until July 1981. It covered the expansion of an 800 metre light aircraft strip into a rigid pavement capable of handling DC9 aircraft within 12 months and at a cost of £6m. Given the conditions on the island, that was a tough enough task in itself. In the event, however, the specification was upgraded, doubling both the contract time and its value, as the project progressed.

The contract for the civil engineering works was won by PT

Balfour Beatty Sakti which had to establish a beach head at Kabil on the east coast of the island and then hack a way through 13 kms of bush to reach the airfield site, building a road as they went so that the earthmoving plant could follow.

Meanwhile, the Development Authority changed the runway design from a rigid to a flexible pavement and upgraded it to Airbus standards. This meant that the contractors had to mobilise a second batch of plant for cement stabilisation, plus a full blacktop fleet comprising an asphalt plant, two paving machines, rollers and ancillary equipment.

Overall, the job has involved a muckshift of some 2.25m cu metres, the laying of 95,000 tonnes of asphaltic concrete and the construction of a 13,500 sq metres apron in pavement quality concrete: the whole to be executed in the middle of a jungle.

Despite these difficulties the airfield is already in use and is on schedule for final completion by the middle of this year. The official inauguration took place in February and the national airline Garuda started twice-weekly flights to Batam at the beginning of this month.

Much still needs to be done on Batam, including the building of a deep water port, before Singapore will really start to feel the wind of competition. But, with the airfield complete, the road network expanded and the establishment of initial industrial developments, Indonesia has at least stirred up a breeze.

TOM SEALY

UK CONTRACTS

Gilbert Ash takes £5m in Scotland

GILBERT ASH CONSTRUCTION, a Bovis company, has been awarded three building contracts with a total value of over £5m. The largest is the blind craft workshop in Glasgow, worth £3.47m; the next project, worth £880,000, is a contract for the University of Strathclyde and the last a factory for Buko at Glenrothes in Fife, worth £850,000. The blindcraft workshop involves the construction of a single storey building. The job at the University of Strathclyde, known as Project N/4, covers the conversion of a building into an engineering application centre. At Southfield Industrial Estate the purpose-built factory for Buko has a production area of 8,775 sq metres and will be built in 35 weeks with a start on site in April.

★

Refurbishment contracts worth over £4.5m have been won by BRIDGE WALKER, building contractors. Laboratories and offices for Beecham Products Research department, Weybridge, form part of a £2.8m total refurbishment contract at the former National College of Food Technology. A £1.8m contract at the Hospital of St. John and St. Elizabeth, St. John's Wood, comprises a new main staircase, two operating theatres, refurbishing four wards and carrying out repairs to structural concrete. At St. Stephen's Hospital, Fulham Road, two wards are being refurbished to form a dermatology unit for the Victoria Health Authority. The contract, worth over £304,000, incindes mechanical and electrical services, a suspended ceiling and strengthening to the floors.

★

A new telephone area office in Aldershot, Hampshire will be built by steelframe building manufacturer CONDER SOUTHERN under a £4.2m design and build contract from British Telecom. The Queen's Award winning Conder Kingsworthy building design will be used for the seven-storey office block. Work begins on April 18, and the 10,147 sq metre building should be ready for occupation in 72 weeks.

★

WILLIAM TAWSE, part of Aberdeen Construction Group, has the Stage One contract of the Mannofield water treatment works in Aberdeen, worth over £3m. The works are required for purification of water pumped from the River Dee and will consist of the construction in reinforced concrete of a pumping station; sedimentation, filtration and sludge thickening tanks; and associated building work, pipework, plant installation, site roads and drainage. When complete, Stage One will be capable of handling 37.5m litres of treated water daily and can be extended to handle double this amount. Work will take 23 months to complete. Tawse also has a contract worth £170,000 for extension of a quay at North Esplanade East, Aberdeen.

★

COSTAIN HOMES has been selected by Wycombe District Council to develop Area Six at Cressex, High Wycombe, a housing scheme involving the building for sale of 100 new homes. This is a joint venture arrangement with the council providing the land and the developer the finance to build the units and to carry out the marketing. The new homes will be offered first to persons nominated by the council, with the opportunity of purchasing at a price below current market value. The contract, which has a turnover value to Costain Homes of £2m, is due to start at the end of May and to be completed within 18 months.

Changes at Benbow

LESS THAN a year after his takeover by Miller Buckley, David Benbow of shopfitters Benbow (Devon) Holdings is stepping down as managing director to be replaced by production and technical director Derek Winkley.

Benbow stays on as deputy chairman and says that his retirement as managing director was "understood" at the time of the merger. However, at 50 and with "certainly another couple of years" with the company, he has things to do with his time.

As shopfitters and specialists in high quality joinery, Benbow is in the right areas of the property/building market—to wit, retailing and refurbishment. David Benbow thinks, and probably rightly, that this is precisely the time to be looking for new markets elsewhere.

The company has been showing what it can do recently, both at home and abroad. It recently completed decorative treatments to the ground floor area of the U.S. Embassy in London's Grosvenor Square and was also responsible for all the interior fitting out and finishes at the recently opened Concert Hall of Wales in Cardiff.

"We are relatively large in shopfitting," says Benbow, "and that is a very fragmented industry." For all the emphasis on refurbishment of shopping centres in recent discussion among the professionals, he clearly feels that there is a limit to the growth prospects in that area.

He would like to find another description for what his company does—"only by name are we tied to retailing"—but alternatives so far have been rejected on the grounds that they will only confuse everybody.

The mesesage is, however, Benbow's absorbtion by Miller Buckley should allow the former to diversify its customer list both industrially and geographically. David Benbow's role, as he sees it, is to create the intelligence service which will seek out the new blood.

WILLIAM

TECHNOLOGY

EDITED BY ALAN CANE

COMPUTER LITERATE TODDLERS BREAK INTO A $3BN MARKET

Reaching the keyboard is the problem

BY LOUISE KEHOE IN CALIFORNIA

WHO'S AFRAID of computers? Certainly not the growing number of "Computer Toddlers" who are becoming a major factor in the $3bn market for home computers. Perched on top of a pile of cushions to reach the keyboard these pre-school children become masters of the machines that thwart their elders. They are becoming "computer literate" before they can read, and sometimes before the word "computer" is a part of their vocabulary.

These are not especially gifted youngsters, just ordinary two to five year olds who in increasing numbers are being given the opportunity to learn from and have fun with computers.

High growth

As a group, these children represent a major new commercial opportunity for computer and software vendors. The explosion in home computer sales, combined with the current "mini baby boom" spells out a huge potential market for computer "learning games" designed to appeal to pre-school children and their parents.

The trend toward younger computer users is already established. According to U.S. market researchers more than half of the home computer users in the country are under 54 inches tall (and presumehly under 14 years old). Though the researchers have not yet analysed the use of computers by those who are under 40 inches in height, the recent proliferation of new pre-school software products indicates a high growth market.

Future Computing Inc, a market research company forecasts that the U.S. market for personal computer educational software (not including the cost of the computer itself) will grow to $1bn by 1987. More than 70 per cent of that market will be in programs designed for use at home rather than at school, they forecast. A high proportion of those home users will be in the "toddler" age group.

Children's software has, until very recently, been a cottage industry created by innovative educators and creative parents. Suddenly, that seems to be changing. Leading the trend are companies such as the learning company of Portola Valley California.

Founded by an ex-teacher, the company has focused on producing programs thet teach concepts and logic rather than reading and arithmetic.

With the recent appointment of a new president and marketing director, the learning company is now aiming to transform itself into a more commercially minded organisation building on its established reputation.

The learning company games make use of beautiful graphics and simple melodies played by the computer to keep the child's attention. A rule established by the company's products is that the "right" answer to a problem presented to the child produces a "reward" in terms of graphics or sound. The "wrong" answer does nothing.

This corrected a major problem with earlier education programs that produced an exciting buzz when the child gave the wrong answer.

One of the most popular beginner's programs is the learning company's "Juggles rainbow" which teaches the ideas of above and below, left and right.

To overcome the obvious problems of giving instructions to pre-readers, the Learning Tree Company of Long Island New York has introduced a "natural voice" addition to the computer in the form of a tape recorded set of instructions that are controlled by the computer program.

Experimenting with children in nursery schools, the company has developed 57 programs for the Commodore Pet that three to five year olds can use on their own.

Learning to program a computor to perform simple tasks can start very early with a game called "face maker" published by Spinnaker. The program allows a four year old to design a face by selecting weird looking facial features—hair, eyes, nose, mouth and ears. With just a few moments of instruction the child can learn to use the program, and in the process pick up how to use menu-driven programs.

The next step is to "program" the face to go through a series of gyrations such as winking, crying and sticking out its tongue—guaranteed to delight an under-five.

For the child that is learning to read, the learning company offers "Magic Spells," a game in which words are jumbled and must be sorted out to stop the demon stealing the gold. Spinnaker publishes "Story Machine," a program that animates simple statements such as "The Dog Runs" to encourage the young writer.

Xerox has recently started distributing a new series of children's programs called "Stickybears." The most elementary is a counting program for three- to six-year-olds.

Reflecting the growing sophistication of the pre-school software market, Xerox packages the program in a brightly coloured book-like cover and includes a picture book and a sheet of stickers along with the floppy disk.

Atari is also about to enter the market with a set of video games that use Disney characters and muppets to teach the alphabet, numbers and simple arithmetic to three to seven-year-olds.

Oscar (well known to all Sesame Street watchers as the bad-tempered character who lives in a garbage can) will pop up and smile for the child who has collected the right number of pieces of trash and deposited them in the bin on the video screen.

Cookie Monster runs around a maze gobbling up cookies along the way in another Atari game.

To suit the manipulative skills of small hands, Atari has designed a new controller unit for the video games console. The 5 × 7 in keyboard has 12 keys that are designated for different functions by colourful overlays. Atari's designers promise that the unit will survive any amount of physical punishment including being drenched with milk.

Texas Instruments starts youngsters off with its 99/4A personal computer that uses rugged cartridges (rather than tapes or floppy disks) to store programs. The company offers a range of programs that make use of colourful graphics to teach number recognition, counting, simple arithmetic, alphabet and pre-reading skills.

Do pre-school children really benefit from the use of a computer?

Sticky fingers

The computer and software manufacturers are giving American parents the hard-sell treatment with messages that suggest computer games are as important as picture books in giving little Johnny a head start in his education. More persuasive, however, is the obvious pleasure that "playing computer" produces among this age group.

As the mother of two "computer toddlers" this reporter frequently wipes sticky finger marks off the video screen and keyboard before reclaiming her computer to work for The *Financial Times*.

ELECTRONIC BANKING

France anxious to lead the world

BY ELAINE WILLIAMS

THE third main stage in France's electronic banking trials began recently at Saint Etienne. France is keen to show the world that it has taken a lead in electronic banking having planned its experiments as long ago as 1978.

Dubbed the Point-Rubis project, it uses a plastic card as a direct replacement for cash. Some FFr 30m has been invested in the experiment with 75 per cent of the funds coming from financial institutions. The remainder of the funds is provided by the commercial sector plus subsidies from the Direction Generales des Telecommunications and the Agence de l'Informatique.

These trials are being carried to give banks and retailers e clear picture of the way ahead in electronic banking. The banks are anxious to develop e coherent interbank system to business and consumers. It will require very heavy investment in technology for banks in addition to the high costs they bear for cheque processing.

Electronic banking does, however, offer the hope of reducing the cases of cheque and credit card frauds, and reducing the number of cheques being processed.

For the retailer the benefits are likely to be faster processing at the checkouts, less cash handling and its inherent problems and less risk of unpaid bills. The customer, too, should reap some benefits in the form of security from card abuse though he will be parted from his cash more quickly than by using a cheque.

In the Point-Rubis project a direct data communications link is set up between the specially designed checkouts, known as point of sales terminals in the jargon of electronic retailing, and the revelant bank's central processing computer.

A message is transmitted with all the details of the proposed transaction such as identification of the retailer, customer verification, amount of sale to the central computer. The computer has access to the customer's account and can allow the sale to take place if sufficient funds are available. It can transfer money from the customer's to the retailer's accounts taking only a few seconds to complete the entire operation.

Initially the system will not be an on-line system and processing will be carried ont at the end of each day. However, full on-line working will be achieved when the second computer centre is set up in a few months' time.

The trials are expected to involve about 150,000 individuals of which about two-third's are holders of conventional credit cards such as Visa which are compatible with the system. Each cardholder can spend FFr 2,000 a day with a limit of FFr 5,000 a week, though Visa card-owners can opt for a higher limit.

Customers can use their cards at 350 point of sales terminals. About 100 are installed in department stores while the remainder are in various retail stores in the area. This covers ebont 70 per cent of commerce in Saint Etienne.

The main contractor for the system is the Societe Generale de Gestion et des Services. Much of the hardware was designed by two French companies, Electronique Serge Dassault and SECRE. The experiment uses the Transpac public data network to link POS terminals to the banking computers.

The experiment will last 30 months in Saint Etienne. The town with its 220,000 inhabitants was chosen at the test site because it is a regional centre with ao extensive business ectivities. Because it has a self contained economic life the banks believe thet significant conclusions can be drawn from any results.

Point Rubis is also important because the trials involve all banks and the entire local financial community — with the exception of Credit Agricole—joined the project. Many different retail outlets are involved

The other two experiments on electronic banking which have already been set up in France are not instant or on line systems as is Point Rubis. In Aix-en-Provence an off-line system using magnetic stripe cards was tested while at the three towns of Blois, Lyons and Caen so called smart cards, which incorporate micro-processors, are being used at retailers' point of sale terminals.

FINANCIAL INSTITUTIONS INVOLVED IN POINT RUBIS

Banque Centrale Des Cooperatives e t-des Mutuelles
Banque de France
Banque Morin Pons
Banque de Paris et des Pays Bas
Credit Postaux
Banque Populaire de la Loire
Banque Rhone et Loire
Credit Commercial de France
Banque National de Paris
Banque Worms
Credit Lyonnais
Societe Generale
Societe Lyonnaise de Depots
Caisse d'Epargne de St. Etienne
Chambre Sydnicate des Banques Populaires

Diving

Container system

CONTAINERISED divers are on the way to the North Sea via a 14-strong Wigan company which for some years has been involved in research on the problems of life support systems for marine and civil engineering contractors engaged on undersea repair, inspection or maintenance.

Safety Air Services (40, Warrington Lane, Wigan) offers a purpose-built container with a twin lock decompression chamber with air and oxygen services connected, which, it claims, can be operational within an hour of arrival on site.

The decompression chamber can accommodate up to six divers with transfer under pressure facilitated by the twin lock design.

Diesel powered air compressors, supplemented by high air pressure back up are available with ancilliary equipment designed to suit the customers' requirements. Mr P. Copley (0942 322141) will tell you more.

Benchwork

Piercing press

REDMAN Engineering of Swindon has designed a new bench mounted press for straight line piercing, which it claims offers metal working companies a versatile low cost alternative to conventional brake presses where the latter's higher capacity may be required only occasionally.

The Unipress 654 allows unit tooling to be located across the whole 650 mm width of the bed and will accept any standard Unitools. It has a 10-tonnes capacity, can handle up to 3-mm thick mild steel and costs less than £2,000. Mr Herbert Galloway, Redmans Sales Manager, is at Hawksworth, Swindon (0793 26394) for more details.

Six packages

SIX SOFTWARE packages for use on the Vic home computer have been introdnced by Audiogenic of Reading. The programs include processing and a database storage and retrieval system. More details on 0734 595647.

THE MANAGEMENT PAGE

EDITED BY CHRISTOPHER LORENZ

'They either made a profit or closed'

John Griffiths reports on the major surgery carried out at Unipart, BL's components offshoot

AT THE beginning of 1982, Unipart, the parts and accessories division of BL, Britain's major car manufacturer, cut 1,000 jobs, a third of its then workforce of 3,000. The cuts were made in the face of what John Neill, Unipart's 36-year-old managing director, describes as "the most bitterly competitive conditions I have known." The cutback was also achieved with little demur from the unions.

The redundancies formed part of a programme to tackle a weak market without "stupidly throwing away our sales margins," says Neill. It enabled profitability to be improved last year and, he maintains, "I expect profitability to improve further, even if there is no increase in demand."

More recently, a novel employee incentive scheme has been introduced. It is based on just one criterion: return on assets. No other criteria, such as increased output or sales volume, will be taken into account. "The scheme must involve employees sharing the overall risks, as well as the rewards, of the company," comments Neill.

Last year's shake-out affected all employees. As well as cutting back the workforce three levels of management disappeared: from BL central staff dealing with Unipart; at Unipart group level; and at Unipart company level. "We took the costs, confusion and complexity out," says Neill.

Neill explains that "the central staffs were crushing entrepreneurial initiative. Not because they were bad, but because three layers spend far too much time examining alternatives. We made everyone—at manufacturing, distribution, and retailing levels—profit centres, making it clear they either made a profit or closed."

That included manufacturing for BL itself. Neill was quite prepared to tell Austin Rover's chairman, Harold Musgrove, to get parts elsewhere if Unipart could not make and supply them profitably. Equally, says Neill, Musgrove was taking at least as tough a line on supplies with Unipart as with suppliers from outside the BL "family."

Neill took a hatchet to other overheads, reorganising transport operations, for example, to the extent that they are lower now in absoluta terms than in 1980. The latest, and biggest single casualty is at Bagington—where Unipart's showpiece 270,000 sq ft warehouse is being closed. It opened only in 1979, cost £9m, is fully computerised, and was surveyed by psychologists to suggest the right colour schemes for maximum productivity.

John Neill: "Employees must share the risks as well as the rewards."

The 170 workers are either being moved elsewhere, or made redundant, again with scarcely a murmur from the unions. Neill appears to have done it all by persuasion, with plenty of informal advance warning. The warehouse had to go "for the company's good"—it was no longer needed.

In the same way, he "persuaded bus-loads of Cowley workers into daily trips to Coventry to cover temporary heavy work loads in the Midlands; even senior executives were pressed into performing song and dance routines in front of workers and franchise-holders as part of a "motivating" road show.

Nevertheless, he acknowledges that, during the past year, "the scale of change has been a shock to the company."

It has been no less of a shock to Unipart's own suppliers.

At the start of 1981, Neill wrote to all Unipart suppliers demanding a price freeze. About half said they would co-operate. A quarter acceded on the second prod. The others wrote back to suggest, effectively, that Neill was out of his mind.

Their letters went straight in the bin—"we got new ones," observes Neill dismissively.

A similar letter went out at the beginning of 1982—but this time demanding a 5 per cent cut. The results were almost precisely the same. "I simply will not accept that we have to be outperformed by the Japanese or anyone else." The exercise is being repeated this year.

While there has been little that Unipart could do about volumes in original equipment business, its strategy has been to offset this decline through selective sales drives in the aftermarket.

It has zeroed in on specific product lines: in particular, oil, antifreeze, batteries and brakes. Neill insists, however, that "I hate cretinous competition which gives away margins." Instead, Unipart has spent money on protecting them. Hence its "life guarantee" Samson batteries cost a lot more than others that can be bought elsewhere; but the marketing concept seems to have worked. Sales, claims Neill, are going through the roof.

Unipart's decision last year to attack the brakes replacement market left some major brake makers furious.

When Unipart could find no industry standards in terms of safety, durability or performance, it employed engineers to set some and then sought suppliers to meet them, not necessarily in the UK.

It advertised a scheme on television whereby 1,500 garages offered free brake tests. Unipart claimed that 50 per cent of the cars tested had faulty brakes which, it implied, showed that some UK manufacturers were applying a double standard on quality between original equipment and aftermarket supplies.

The TV campaign jammed Unipart switchboards until midnight and caused an outcry among brake makers. Since then, Unipart's brake sales have almost quadrupled despite the charging of premium prices.

These are some of the factors behind a sales-per-employee increase of 25.4 per cent compared with 1981 (when Unipart's sales actually rose 4 per cent, while direct workers were cut by 7 per cent and salaried staff by 17 per cent).

This is very much in line with the pattern of Unipart's return on assets. The figures show a decline to the end of 1980 and a sharp increase ever since. They lie behind BL's accounts statement that Unipart is self-funding and speculation that it is one of few BL parts which could prove an early candidate for privatisation.

Exploding the myth

FOR THE motor parts and accessories industry, 1982 was the year which "finally exploded the myth that the after-market is recession proof." So says John Neill, managing director of Unipart, the BL parts and accessories subsidiary.

The theory behind the "myth" is that, in a recession, cars will be retained longer, which should boost demand for replacement parts. Accessory sales should rise as owners compensate for having to live with a vehicle for longer than intended. This should in turn compensate both for lower volumes in the original equipment business in a weak new car market and for original equipment business lost to UK companies through higher imports of new cars.

It hasn't worked out that way, not least because some component makers have been virtuously digging their own graves—or at least some very nasty pitfalls—to the benefit of consumers. The tyre industry is the obvious example: radial tyres doubled mileage capability—and as a consequence ravaged the tyre-makers' replacement markets.

Assessing the precise size of the after-market is extremely difficult. In last year's Monopolies and Mergers Commission report advocating the end of exclusive franchising of replacement parts by manufacturers, the commission put the size of the total UK market, including accessories, at £2bn; estimated imports at £1.2bn to £1.5bn; and exports at £2.2bn to £2.5bn. It reckoned there were 300 main parts makers and concluded that a further 1,700 smaller companies were also involved. About the only certainty is that last year the after market declined.

In these conditions Unipart has been unable to retain a firm grip on export sales, which accounted for just under £100m of its total sales of £350m last year (down £50m on the previous year). At the end of 1980 Unipart announced the launch of franchised wholesaling and retailing operations for Belgium, the Netherlands, Finland and Denmark, with plans to follow up in West Germany. But it found the going very hard and the exercise is now on "hold." Nevertheless, Neill insists that "when the time is ripe, we'll expand rapidly overseas."

Business courses

ew to succeed at data base esign, London. April 26-28. ee: £330 + VAT. Details from: avant, 2 New Street, Carnforth, ancs, LA5 9BX. Tel: 0524 34505. Telex: 65138.

resentation skills for marketers, Berkshire. May 18-20. Fee: members of the Institute of Marketing—£340 + VAT: on-members—£390 + VAT. Details from Harold Shilling, The College of Marketing Limited, Moor Hall, Cookham, Maidenhead, Berkshire SL6 9QH.

Managing corporate turnarounds, London. April 21. Fee: £150. Details from Sue Coan, London Business School, Sussex Place, Regent's Park, London NW1 4SA. Tel: 01-262 5050.

Principles of effective management, Kent. May 8-13. Fee: £600. Details from the Director of Client Services, Sundridge Park Management Centre, Bromley, Kent BR1 3TP. Tel: 01-464 4121.

Managing the computer resource, Oxford. April 24-29. Fee: £1,050. Details from Sarah Franklin, Oxford Centre for Management Studies, Kennington, Oxford OX1 5NY. Tel: 0895 735422. Telex: 83147 attn OCMS.

Directors' marketing workshop 1983, Cookham. May 5-6 1983. Fee: £380 + VAT (non-members) £340 + VAT (members). Details from Harold Shilling, The College of Marketing Ltd, Moor Hall, Cookham, Maidenhead, Berkshire.

Strategic management in troubled times, Bradford. June 1-3. Fee: £200. Details from Diane Griffiths, University of Bradford Management Centre, Heaton Mount, Keighley Road, Bradford, West Yorkshire.

Marketing for finance directors, London. June 1-2. Fee: £350 + VAT. Details from Oyez International Business Communications Ltd, 3rd Floor, Bath House, 56 Holborn Viaduct, London EC1A 2EX.

Marketing management, London. April 25 - May 6. Fee: BFr 80,000 (non - members), BFr 70,000 (members). Details from the Registrar, Management Centre Europe, avenue des Arts 4, B-1040 Brussels, Belgium.

Consumer marketing in the UK, Cookham. May 22-26. Fee: £475. Details from College of Marketing, Moor Hall, Cookham, Berks.

Corporate planning in practice, Bradford. May 23-27. Fee: £400. Details from Diane Griffiths, University of Bradford Management Centre, Heaton Mount, Keighley Road, Bradford, West Yorkshire.

Expatriates

Jobs in jeopardy on return to UK

BY ARNOLD KRANSDORFF

Uncertainty in the UK labour market and a conscious effort by many large companies to cut costs have changed the prospects and conditions of employment for many top British managers working abroad.

Over the past two years there have been significant changes in corporate policies towards cost-of-living allowances, housing and travel, according to a new survey of 32 major companies employing more than 7,000 expatriates in over 50 overseas countries. At the same time the jobs of expatriates, on repatriation, have become much less secure.

The survey*, by Organisation Resources Counselors, an international personnel management consultancy, covers the engineering, computing, banking and petroleum industries, all of which have heavy representation overseas.

In the past it was usual for companies to guarantee a job—and often promotion—when an employee returned home from an overseas assignment.

The ORC survey found that this is no longer the case in a majority of companies. In 1981, when the company's first expatriate survey was carried out, around 38 per cent of companies reported that they made no job guarantees to assignees on repatriation.

In 1982, this figure had jumped to 56 per cent. "This shows that everybody's job is in jeopardy, not only those who are home-based," observes ORC.

The new economic realities were also affecting the numbers of employees who received formal "orientation" training for overseas assignments.

In 1981 just over a fifth of companies did not provide any form of briefing to employees about cultural conditions in the country of assignment. A year later this figure jumped to 41 per cent.

There has also been a change in the way cost-of-living allowances are adjusted by some companies in response to changes in exchange rates and inflation.

While the most popular method of adjustment is still the annual review, 23 per cent of companies said in 1981 that they made immediate adjustments in the face of moving exchange rates and inflation.

In 1982 only 3 per cent said they reacted immediately, the rest preferring to adopt a "threshold" approach, says ORC. This involves making adjustments only when exchange rates and inflation reach pre-determined levels.

There is also a move to provide free overseas housing to the expatriate while leaving him to deal with his own home during his absence, the survey found.

In 1982 the number of companies which were not making any sort of charge for company-owned premises rose from 35 per cent to 50 per cent.

ORC explains that companies are now less willing to take on the burden of responsibility for home-country residences, preferring to leave the problem entirely in the hands of expatriates. To compensate, they provide overseas housing as a free benefit, it adds.

The survey also noted a greater use of economy class air fares to and from the overseas location, whether for business or home leave. The number of companies which stipulated economy class for their overseas employees rose from 46 per cent to 56 per cent in 1982.

There has also been a shift in company policy towards home leave. In 1981 42 per cent of companies required their expatriates to return to the UK for their paid home leave; in 1982 this figure dropped to just over 16 per cent.

ORC says that this reflects pressure by expatriates as their employers to enable them to make the best use of foreign assignments. Frequently, expatriates prefer to holiday in places other than the UK, says ORC.

* *Policies and Practices for UK Expatriates, available from ORC, 78 Buckingham Gate, London SW1. Price £250.*

THE ARTS

Architecture/Colin Amery

Bridging the gap

When 500 rockets were fired simultaneously in May 1883 to mark the opening of the great Brooklyn Bridge, the event was seen as a great climax of the American desire to join East and West and to confirm man's subjugation of nature. The celebrations also confirmed the final triumph of engineering and the completion of a marvel that was to become one of the wonders of the world. Today it is hard to recapture that particular sense of glory—a sense that is still so strong in America that this combination of industry, science, democracy and labour can conquer the world.

To remind us of that sense of achievement the Brooklyn Museum has arranged a splendid, learned and exciting exhibition, *The Great East River Bridge 1883-1983*, sponsored by the Chase Manhattan Bank which will run at the museum in Brooklyn, New York until June 19.

It is often said that architectural and engineering subjects do not make good exhibitions. I have always disagreed with this because, like so many other things, it depends how it is done. While nothing can replace the actual experience of walking between the crazed cyclists and Walkman-equipped joggers on the promenade deck of the bridge itself—this exhibition manages to evoke a powerful sense of the bridge as a symbol and a part of the civic folk memory. It also, in simple didactic terms, shows how the wonder was created.

It is a good story, made particularly dramatic by the display of some of the great cache of detailed and colourful engineering drawings that was only recently rediscovered by an engineer in the carpentry shop of the New York City Department of Transportation. Now these 10,000 drawings have been catalogued and make a rare and impressive record of 19th century American engineering achievement.

Today the great thrill of a walk or drive across the Brooklyn Bridge is the soaring drama of the Manhattan skyline—it is a good spot to observe the manic intensity of the development of mid-town. In fact from the bridge you can read the *three-dimensional graph of New York* property development in a most vivid way. This experience is heightened by the fact that the walkway on the bridge is raised above the traffic and decked like a ship so that you are right among the web of steel that holds the whole tensile structure together.

The exhibition tells the story of the construction through the personalities involved, particularly Washington A. Roebling (1837-1926) who followed his father John Roebling in the building of the bridge. Washington believed management should take the same risks as labour and ha constantly descended underwater to the caissons. He paid the price by suffering terribly from the bends and as early as 1872 ha became a permanent invalid. His wife Emily took over at this point, conveying her husbands orders from his bed and handling all his instructions. She is suitably commemorated by a fulsome tribute to the power of women behind "every great man" on a plaque on the bridge itself. How she must have rejoiced when she was the first person to ride over the bridge in a carriage—carrying a crowing cockerel as a symbol of victory.

Brooklyn Bridge: a union of hearts and hands

To convey the iconic significance of the bridge a rich and varied range of paintings and photographs has been gathered together. Artists have made the bridge a subject because of its triumphant beauty, cumulatively their work is impressive but not high on artistic quality—perhaps too many have been generously included in the show.

The two Gothic-arched towers and the delicate threads of wire rope that apparently effortlessly carry the weight of the bridge speak best of all for themselves. Don't go to the exhibition without walking at least one way on the bridge.

At the Hudson River Museum there is a major exhibition that relates to a book that has now been published in England. The book *Ornamentalism* is by Robert Jensen and Patricia Conwey and is published by Allen Lane in London and Clarkson Potter in New York.

Although the book is a useful compendium of the current trend towards a new decorativeness in architecture and design—it is not until you see the exhibition—which runs until May 15—that the importance of the subject and the poverty of the results to date are fully exposed. The book is really very superficial—an attempt to create another journalistic movement, like Post-Modernism, without any real concern for the quality of the results. To say that Ornamentalism is about the "surface of things rather than their essence" seems to me to expose the very weakness of the idea. To say that "it dances on the surface of technology" makes weak an idea that brings a new strength of purpose to architecture and design.

The show is a mixture of art objects and architecture and interiors—at no point does it attempt any synthesis. In a way the success of the show is that it makes the spectator realise that soon some of the dross will fall away and a few good artists, architects and designers will be free, not to start a bogus new movement, but to realise in their own work the important sources of decoration for architecture.

The important names to look out for now and in the future are: Ned Smyth artist, sculptor and mosaicist, Richard Gillette, Michael Graves, Roger Ferri, Hans Hellein, Susana Torre, and Peter Wilson (for his gardening). There is a lot of kitsch, jokey stuff that will not last for more than the life of the show and a great deal of work that is rightly included for its craftsmanlike skills.

I will be writing later about the interesting area where the battles are to be fought—the point where ideas in painting and sculpture appear to suggest important directions for architects to follow. Ornamentalism is such a woolly concept that it seems to preclude any powers of discrimination on the part of the editors of the book and the show. This is sad because they are on the right lines. They, like so many of us, sense the need for enrichment, colour and delight in our new surroundings—but it is the search for quality that will produce the results not an appetite for variety.

Micheal Graves is an architect who also designs furniture and fabrics and has an immaculate colour sense. His work shows a consistancy that could carry us through this period of architectural transition. What is apparent is that American architects and designers have more opportunity than their British counterparts to flex their ornamental muscles. The climate is still so much freer and creative in the U.S. than in hide-bound Britain.

Another example of the openness of the American mind to architecture is a small exhibition that is also at the Hudson River Museum before touring much of New York State. It is called *Architectura on Paper* and has been compiled by Deborah Nevins. She sees the drawing as the vital opportunity to communicate architectural ideas. She is not afraid to be didactic and her show explains what a plan is, how a section works, how designs are developed through drawings, and the difference between working and presentation drawings. She has rich sources to draw on and demonstrates her points with work by Hector Guimard, Francois Blondel, Stanford White and several contemporary American architects. It is a crystal clear and careful show—educational without a hint of boredom.

Making music in Budapest

David Murray tells music-lovers where to go one of these Easters

For many years now, Budapest has celebrated new music in the autumn; but since 1981 it spreads another, more capacious festival over 10 days at the end of March. There are concerts — as many as four — every night and musicals and operettas and ballet; by day there are exhibitions and excursions within the city and out into the country (picturesque or saturated with history, frequently both) and at all hours a lot of exuberant gastronomy. And "Spring"? Well, theirs is in principle earlier and warmer than ours, in fact subject to British lapses: my five days at Festival-end were alternately sun-kissed and drear. But Budapest is beautiful in all weathers.

The level of music-making in Hungary is so high that the festival needn't spend much hard currency on international names for window-dressing. Plenty of native musicians have international names, and the festival also welcomes back emigrants — 10m Hungarians live in Hungary, 15m abroad—like Cziffra and György Sándor. Bartók and Kodály figure large in the programmes, and this year Ligetti, too, but amid familiar Western fare; one expects a special idiomatic grasp in the playing of national masterworks, and one isn't disappointed.

There are even more Bartók masterworks, for example, than is generally realised and one of them is the first op. 10 "Imaga" with which the Hungarian State Symphony began their last festival concert. Its title translates uncertainly as "Blossoming" or "In full bloom," but its heady fragrance is as direct and potent as Dovzhenko's high - summer imagery: expectantly still, teeming, fructuous, charged with an impersonal Eros to bursting-point. It is a chain of woodwind solos (over Impressionist strings) in which speaking inflections make all the difference, and there was pure pleasure in hearing them so instinctively shaped.

It was hard to guess how much was prompted by the conductor János Sándor, and how much he merely presided. In Bartók's second and third piano concertos he had György Sándor (no relation) as his imperious soloist and was content to follow him. There was too little even-handed dialogue between piano and orchestra, with a consequent loss of cumulative drama (especially in the Second); but in Bartók's piano idiom Sándor's credentials are beyond question and the plain *piano-playing — tough, pithy, astringent*—was a lesson.

That concert was held in the main hall of the Zeneakadémie, the Academy of Music, which has the old-fashioned warmth of a mini-Concertgebouw. I missed any concert in Pest's newly restored Vigadó (the old acoustic is said to have been too faithfully recaptured), but across the Danube in Buda the German Requiem of Brahms expanded graciously in the grand Matthias Church. Much rebuilt, it suggests Keble came to Byzantium—the Turks held Hungary for a century and a half, and their influence has been happily assimilated.

Ervin Lukács led the Radio Choir and Budapest Concert Orchestra in a performance of loving breadth, much less austere than present convention dictates over here—the Brahms of the Requiem was in his mid-30s, after all, with the Four Serious Songs almost 30 years ahead. György Melis, a renowned Bartók Bluebeard, was majestic and tender in his solos; young Júlia Kukely, perhaps flattered by the deep acoustic, sounded ravishing in the soprano movement.

The festival collaborates with other state organisations in running an annual *International Composers' Competition*, with the prize-winning works guaranteed publication and festival performances the next year. The 1982 competition prescribed string quartets; no first prize was awarded, but a second and two thirds went to youngish Chinese-Canadian, Russian and Hungarian composers for music of vividly individual character, duly premièred last month in *the smaller Zeneakadémia hall*.

That real promise was identified was shown by the recurrence of the third-prize-winners, Vladimir Holshchevnikov and Miklós Csemiczky, in the 1983 list of awards (for wind quintets — anonymous submissions, different judges). Holshchevnikov's quartet had Shostakovich in the background of its troubled lyricism; much play with sighing glissandi covered a plain naiveté in construction. Far more "professional," Csemiczky's one long, multi - sectioned movement carries on the Bartók tradition with keen resource and with specific debts to the Master's fourth and fifth quartets. It lost something, probably, in the very cautious performance by the New Budapest Quartet.

Attacked with far more verve by the Kodály Quartet, Chan Ka Nin's Quartet no. 2 also had swarms of glissandi; and chains of flashing cadenzas for its "Brillante" opening, a crackling scherzo played mostly with pencils-and-rubbers and bursts of the Hong Kong folk-pop of the composer's childhood—more sweet than sour—mewed in unison. The smiling innocence of this cross-cultural marriage was astonishing and all aurally imagined—no trace of calculation-on-paper. The composer is 34; heaven knows what he will do next. The 1984 competition, by the way, prescribes piano trios.

The festival concluded—as it will next year too—with a recital by Georges Cziffra, in the big Erkel Theatre to accommodate the excited crowds. Cziffra has lived in France these many years, where his hair-raising autobiography has just been published. We do not hear him in Britain; there is a story about his last Festival Hall appearance which, if true, would explain that entirely, but we miss him all the same.

His virtuoso fingers are intact, as also his trick of staring unabashed into the audience for approbation in mid-flight. There is a new serenity about his playing, still with a whiff of the sulphurous and *the farouche*. Liszt's Second Polonaise was electrical, but two Schubert Impromptus sang angelically. If the Third Ballade of Chopin suggested that Cziffra's sheer immediacy denies him a really large-scale reach, the Polonaise-Fantaisie proved him to have visionary powers well beyond keyboard-lionery.

Music-lovers who enjoy a break before Easter should remember Budapest. Next year's Spring Festival is cut to the exact shape of the one just past—a case of general satisfaction with the formula, no doubt. I should be the last to demur, though Western - style programme-notes would be an improvement; for the German Requiem we weren't told even the number of movements.

Alcina/Elizabeth Hall

Stanley Sadie

London Handelians loyal to the Handel Opera Society could hear on Saturday a concert performance of *Alcina*. The familiarity of this "magic opera," whose music is as spectacular as its story, is merited. The HOS has staged it twice and two other productions have been seen at Covent Garden; there have been concert versions and there is a Sutherland recording. Understandably, anyone prefers to revive a good, popular opera rather than a doubtful, lesser-known one; but perhaps the HOS choice was ill-advised.

For a start, no concert version can be near to complete; the programme claimed modest cutting, but seven arias went and 10 were done at less than half-length. Second, it needs not just a goodish cast but a superb one. Third, the performance recalled, in its stylistic stance, the revivals of 10 or 20 years ago and — as indeed Charles Farncombe knows—things have moved on.

It is not just a matter of period instruments, though they help by inducing a more apt manner of articulation. The performance was earthbound partly because much of the orchestral playing was airless and heavy; bows too adherent to strings, overmuch vibrato. Probably it was cautious because under-rehearsed; certainly it was under-prepared, for one noted with dismay that the same arbitrary reorchestration was used in the overture and dances as in the society's early days, when people still felt that Handel needed improvement.

Otherwise, Mr Farncombe piloted the performance with a careful hand, and tempos were sane and considerate. Of the cast, the most experienced Handelian was Wendy Eathorne, who showed her paces in a brilliant account of Morgana's "Tornami a vagheggiar," light and agile, with ringing high notes. Alcina was sung by Penelope Walmsley-Clark, not with quite enough intensity or feeling for words and meaning, yet there is dramatic edge and a gleam to the tone that promise well. The scena ending Act II had vivid moments.

Cynthia Buchan made a strongly focused Bradamante with plenty of vitality though tending to snatch at the divisions. Ruggiero, composed for a high castrato, was the alto Robin Martin-Oliver, whose voice rings best above top C, where most allos fade; the bottom is slendar. His brillant arias went well, but the role's heart lies in the expressive ones, especially "Verdi prati," and these were cool. Glenn Winslade provided a pleasingly graceful if over-vibrant tenor and Eric Roberts was the warm baritone.

Christian Zacharias/Wigmore Hall

David Murray

Another welcome series of Sunday Morning Coffee Concerts began yesterday at the Wigmore with a piano recital by the 33-year-old German pianist Christian Zacharias. Fresh from his South Bank performance of Mozart's last concerto, tightly thoughtful and appealingly honest, he played Schubert and Schumann.

His Schubert was the not-so-late A major Sonata, D. 664. He brought some of his Mozart virtues to it, aptly enough; it danced easily, at impeccable *tempi and with an air of almost*-artless simplicity. The Zacharias touch is firm and a little dry, and though it was luminated for Schubert with a great deal of pedal—that is becoming a new German trait—it hasn't great variety: the many returns of the excellent tune of the final Allegro intimated much the same things every time. It was intelligent, thoroughly amiable playing nonetheless.

Zacharias is inclined to end movements as if surprised at having abruptly run out of notes; there was fortunately no room for that in Schumann's *Carnaval*, though he enacted a good tacit brood for the "Sphinxes" (there is no *excuse for attempting to* play those secret formulae). A dearth of new colours was, however, a limitation upon his conducting of Schumann's fantastical parade. Yet it was sensitive, lively, *bien recherché*—each small piece was stamped with definite ideas; sometimes doubtful, always clear-cut. The wild final "March" never really threatened to go off into the frantic spiral it aims at. In this hall, the Zacharias *fortissimo* was a stiff-fingered, unlovely sound.

Cheltenham Festival plans

This year's Cheltenham Music Festival will run from July 2 to 17. Among the artists appearing are Dame Janet Baker, Alfred Brendel, the Gabrieli Quartet, James Galway, Yehudi Menuhin and Paul Tortelier, as well as three symphony and three chamber orchestras.

The major themes will be celebrations for the 80th year of Sir Lennox Berkeley and for the centenary of the birth of Webern. Brahms 150th anniversary is also commemorated. Fifteen composers have been invited to write one minute variations on the Reapers Chorus theme from Berkeley's opera *Ruth*—David Bedford, Richard Rodney Bennett, Michael Berkeley and John Tavener have contributed.

Music for 'Alceste' / St. John's

Max Loppert

Late in life, Handel foresook opera and oratorio for an unfamiliar brief venture in the composition of incidental music for a play. The drama was Tobias Smollett's *Alceste*, intended for Covent Garden in 1750; for reasons that remain unclear its performance never took place. The play is lost; but though Handel, with his customary good housekeeping, redeployed the music in later works, the *Alceste* score survives and was given a rare concert performance at Smith Square on Saturday by the Academy of Ancient Music.

The music is, of course, mature Handel; all of it is *worth reviving and some of it* is wonderfully beautiful. The score seems not to have run continuously, but to have provided substantial episodes, functioning perhaps as divertissement, within the play. After an overture, there follows the celebration sequence of Act 1, the Hades and Elysium passages of Act 4, then a second and final celebration.

It is hard to work out just how the score and the play were intended to mesh together; but not hard to take delight in the music as it remains. Two of the solo numbers, a sleep song for the muse Calliope (most delicately and poetically delivered by Emma Kirkby) and Charon's alarmingly vivid "Ye fleeting shades" (pawkily sung by David Thomas), are of extraordinarily graphic quality — Handel's "supreme attributes of the musical dramatist" (as the New Grove deems them) are no less strikingly evidenced in these tiny gems than in his most famous operatic invention. The celebratory sequences, including two florid airs for tenor (William Kendall), are less remarkable, but not less masterly.

The Academy and its director, Christopher Hogwood, placed the *Alceste* music on disc a couple of years ego with some of Saturday's singers. Obviously, there is a fund of enthusiasm for the revival; unlike in some Academy performances of recent memory, that enthusiasm was transleted into playing end singing of infectious charm — not just cleanly articuleted (and well-tuned, apart from some oboe squawks) but sharply and communicatively projected. Singers' words, Miss Kirkby's and Miss Thomas's excepted, were unclear; that was only a tiny blot on the evening's pleasure.

Arts Guide

Music/Monday. Opera and Ballet/Tuesday. Theatre/Wednesday. Exhibitions/Thursday. A selective guide to all the Arts appears each Friday.

Music

April 8–14

LONDON

London Concert Orchestra and Chorus conducted by Richard Hickox with soloists including Felicity Palmer and Norman Bailey. Elgar's Dream of Gerontius, Royal Festival Hall (Mon). (928 3191).

Vanya Milanova, violin and Elizabeth Altman, piano. Beethoven sonatas. Queen Elizabeth Hall (Mon). (928 3191).

Royal Philharmonic Orchestra conducted by Walter Weller with Janet Baker, mezzo-soprano. Wagner and Mahler. Royal Festival Hall (Tue).

London Concert Orchestra conducted by Harry Rabinowitz with Malcolm Binns, piano. Russian programme. Barbican Hall (Tue). (638 8891).

Philharmonia Orchestra conducted by Bernard Haitink with Zara Nelsova. Elgar. Royal Festival Hall (Wed).

London Sinfonietta conducted by Antony Pay. Oliver Knussen, Simon Bainbridge and others. Queen Elizabeth Hall (Wed).

English Chamber Orchestra conducted by Norman del Mar with Oscar Shumsky, violin. Rossini, Mozart, Saint-Saens and Beethoven. Barbican Hall (Wed).

London Symphony Orchestra conducted by Andre Previn with Yuzuko Horigome, violin. Mendelssohn and Prokofiev. Royal Festival Hall (Thur).

Lontano, directed by Odaline de la Martinez with Mary King, mezzo-soprano and Nigel Robson, tenor. Purcell Room (Thur). (928 3191).

Bonnie Scott's, Frith Street: Pianist Cedar Walton leads a quintet including trombonist Curtis Fuller and drummer Billy Higgins.

PARIS

Marilyn Horne recital (Mon) TMP – Chatelet (281 1983).

Jaap Van Dam recital (Mon) Theatre de l'Athenee (742 6727).

Alfred Brendel, piano: Beethoven sonatas (Tue), Salle Pleyel (563 3873).

Itzhak Perlman and **Vladimir Ashkenazy**: Brahms' sonatas for violin and piano (Tue). Theatre des Champs Elysees (723 4777).

Ensemble Orchestral de Paris with Jean-Claude Pennetier as conductor and soloist: Haydn, Janacek, Schoenberg (Tue). Sale Gaveau (563 2030).

Orchestre de Paris conducted by Daniel Barenboim with Maurice Andre: Beethoven, Haydn, Elgar, Scriabin (Wed, Thur). Salle Pleyel (563 3873).

Marielle Nordmann – harp recital (6.30pm); Bruno Pasquier – compositions for an alto (8.30pm); traditional Latin American music (10.30pm) Thursday all three concerts. Opera Comique (296 0611).

ITALY

Rome: Auditorium via della Conciliazione: Gruno Gelber, piano, Shostakovitch and Brahms (Mon and Tue).

Rome: Auditorium Foro Italico: Uto Ughi, piano, Beethoven and Schubert (Wed and Thur).

NEW YORK

New York Philharmonic: Zubin Mehta conducting, Krystian Zimerman piano. Schoenberg, Liszt, Debussy (Tue); Zubin Mehta conducting, Gidon Kremer violin, Kim Kashkashian viola, Mozart, Bruckner. Avery Fisher Hall (874 2424).

Boston Symphony: Seiji Ozawa conducting, Hildegard Behrens soprano. Mozart, Strauss (Wed, Thur), Carnegie Hall (247 7459).

New Music Consort: Wuorinen: Trio for Brass Instruments (world premiere), Lundborg: Ghost Sonatine (world premiere), Boulez, Berio, Davidovsky (Thur). Carnegie Recital Hall (247 7459).

Alice Tully Hall: Maurice Bourgue oboe, Richard Goode piano. Demerssemann, Mozart, Schumann, Brahms (Mon, Tue); Benita Valente soprano, Cynthia Raim piano. Bach, Schuber, Strauss, Ravel, Wolf (Thur). Lincoln Center (362 1900).

CHICAGO

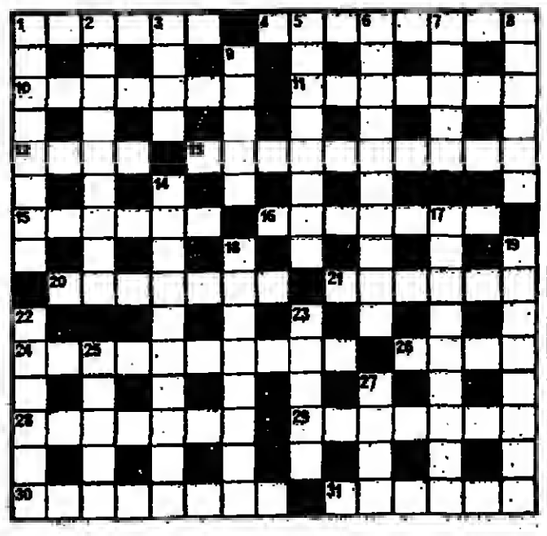
Chicago Symphony: Sir Georg Solti conducting. Wagner (Thur) Orchestra Hall (435 8122).

VIENNA

Musikverein (858 190): Mirella Freni lieder Recital. Piano Paola Molinari. Mozart, Rossini, Verdi, Duparc, Faure, Rachmaninov (Tue).

Konzerthaus (721 211): Natalia Gutman, Cello. Eliso Virsaladse, Piano. Grieg, Mendelssohn and Prokofiev (Mon); Vienna Symphony Orchestra, conductor Christoph Eschenbach. Natalia Gutman, Cello. Beethoven and Shostakowitch (Thur).

F.T. CROSSWORD PUZZLE No. 5,143



ACROSS

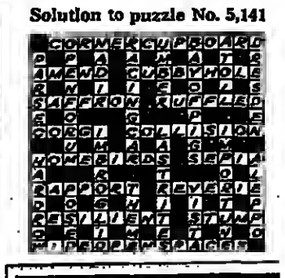
1 Get mother to request the fabric (6)
4 Great victories off the coast of Kent (8)
10 The girl has a setback with the payments (7)
11 Man governed by the body (7)
12 It is lost if they have it (4)
13 Rung twice to tell of good news (6, 4)
15 Drags behind the beaten paths (6)
16 Charles is about to lease the cottages (7)
20 The Saint we leave for the North (7)
21 African soldier has to request change of air (6)
24 This is what gets a team down (10)
26 Confusion where people eat (4)
28 Where sailors used to get a suspended sentence (4-3)
29 Type of relief for the handicapped (7)
30 "On the —— Djinn" (Sorcerer) (8)
31 Private eye who used little grey cells (6)

DOWN

1 Lifeless, crazy, but most enthusiastic (4, 4)
2 She was named after a waterfall (9)
3 Places fought for at Wimbledon (4)
5 Nothing gets round a sound attempt completely (8)
6 You must be pretty sick to be on it (6, 4)
7 The girl is inside—that is stupid (5)
8 Seat for theologian in the auction (6)
9 Publication is to take legal action (5)
14 A scoundrel proves that there is no discrimination on the railways (10)
17 "I met a —— from an antique lane" (Shelley) (9)
18 Frank, confidential kind of talk (3, 2, 3)
19 The girl is shut up—how wasted (8)
22 Earnest entreaty through light inside (6)
23 Monuments—to doctors? (5)
25 High-flying frolics (5)
27 Airport—it is a game of chance (4)

The solution to last Saturday's prize puzzle will be published with names of winners next Saturday.

Solution to puzzle No. 5,141



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Monday April 11 1983

Moscow and the Press

THE SOVIET leadership and its officials have an unhappy knack of giving themselves away. The expulsion order against Mr Anthony Robinson, the Moscow correspondent of the Financial Times, is yet another display of this talent.

Mr Robinson was accused of engaging in "unacceptable activities," with no further explanation offered. In Soviet officialese that can mean just about anything that officialdom dislikes. The phrase in this case also echoes the reason given by the Foreign Office in Loodon when, on March 31, it ordered a Soviet journalist out of the country.

This echo clearly identifies the expulsion of Mr Robinson as a straightforward reprisal, not to say an act of splte. He is being thrown out not for unacceptable activities in any honest sense of those words, but because Britain has expelled as a spy Mr Igor Titov, London correspondent of New Times, the Moscow weekly.

Every country has the right to expel spies, provided they are spies. It is quite another matter for Moscow to start a game of tit for tat of which nobody can say where it will end. The recent unmasking and expulsion of groups of alleged Soviet spies in Britain, France and Spain offers Moscow, if it so wishes, plenty of opportunity to play this dangerous game. Doing so would do nothing for the reputation of Mr Yuri Andropov and his new regima in the Kremlin.

Retaliation

Moscow's retaliatory action against Mr Robinson is a flagrant breach of the Final Act of Helsinki signed in 1975. In that document the Soviet Union, the other European states, Canada and the U.S. undertook to improve conditions under which foreign correspondents work in each other's countries. Tha relevant passage says: "The participating states reaffirm that the legitimate pursuit of their professional activity will neither render journalists liable to expulsion nor otherwise penalise them."

That should be clear enough: gathering and publishing information is a legitimate activity. Bot Moscow sees it in a different light. The role of the Soviet journalist is very different from that of his western colleague. In the Soviet Union tha journalist is expected to support the system and to put over its viewpoint.

Resentments

With such an attitude the Soviet Union has at all times had difficulties in accepting the rola of the western journalist whose first duty is to report fact as completely as possible. Resentments against foreign correspondents have often been aroused in Moscow, it is not unusual for them to be submitted to harassment.

Moscow's secretiveness can be attributed to a defensive attitude rooted deeply in Russian history. It goes back to a time well before the Communist revolution of 1917. By clinging to it and restricting foreign correspondents (as well as its own journalists) the Soviet leadership is rendering itself a disservice. Recent changes under which the Soviet press may report the existence of certain grievances and inefficiencies point in the right direction; but there is a long way to go.

Foreign correspondents still face great difficulties in providing a full reporting service. Their access to information is limited, even though, as Mr Robinson has shown, it is possible to do an outstanding job against all the difficulties. If the difficulties are now to be increased, Moscow must be prepared for a heavy loss of western confidence.

Kremlin leaders do not usually pay much attention to public opinion in the West, unless it suits their book to do so. They would be wise to become more sensitive at a moment when Mr Andropov is trying to sweep away the many cobwebs that hamper Soviet society and, in particular, the Soviet economy. Tha overdue modernisation of Soviet industry requires commercial exchanges and wider co-operation with the West.

Both require mutual confidence; but there can be no confidence unless the Soviet Union permits a flow of honest information showing Russian problems as well as Russian achievements.

Data protection: many loopholes

THE DATA Protection Bill, which starts its second reading in the Commons today, will be the subject of fairly strenuous attack.

Although its ostensible purpose is to reassure us all, on the eve of an electronic 1984, that computers will not be allowed to use their endless memories and effortless ability to traffic information against the interests of our liberty, a Bill which takes so little trouble to conceal its vast loopholes forms an easy target.

The Opposition will brand it as the third leg of a triangle of repressive law—the police Bill and the Nationality Bill being the others—to have been conceived by Mr Whitelaw's Home Office this Parliament. The British Medical Association, one of several special interest groups to be worried about the Bill, sees it as another indication of Government willingness to place a higher priority on police power than other principles, such as the confidentiality of medical record-keeping.

Access

The Bill's main provision is to require all those who store information about individuals inside computers to register with a data protection registrar and to state for what purpose the data is held and to whom it might be made available. Individuals who believe themselves to be in a data bank may then, on payment of a fee, demand access to their electronic file and where appropriate go to court to insist upon the correction of inaccuracies and to seek compensation.

As one would expect, however, broad exemptions have been granted from this central provision. Right of access does not apply to records concerned with national security or material "likely to prejudice" crime prevention or detection, the pursuit of offenders, tax gathering and the control of immigration. Personal data held for domestic purposes is also excluded. In addition to these specific exemptions, tha Home Secretary may also deny access to any information covered by "any enactment" whose confidentiality he feels ought to be preserved. This looks like a blanket power to block virtually any Whitehall file.

From one important point of view however the Bill is unreservedly welcome. It will, unless the drafters have made some hideous miscalculation, take Britain into compliance with the European convention on data protection. This removes the threat that Britain could become an outcast from the movement of electronic data, something which would be disastrous for many companies.

In one other respect the Bill represents a step forward. It opens up the principle—at present only enshrined in certain special areas, such as the Consumer Credit Act—that individuals do have some right to know what records kept about them say. In theory, you need wondar no longer whether the building society had an undisclosed motive for refusing your mortgage or the credit card company had an ill-informed one for rejecting your account. This should help to interrupt the vicious circles of misinformation which computers are all too capable of generating. It is a principle upon which reformers will be able to build.

The problem is that, having offered a glimpse of this promised land of a more accessible information system, the Bill brings down shutters, not only in its exemptions, but because it does not cover material in ordinary, hard-copy files. It will remain simple and quite legal for anyone to sift sensitive information into a manual component of their record system.

Impractical

The Home Office's defence for excluding manual files—they are covered by German law—is that inclusion would be impractical in terms of definition and scope. Anyway, it is added, public concern is about the speed and memory of computers, not of card files. These points are both valid, but they add to the conviction that this is a weak piece of legislation, rather than the charter of freedom its promoters would have us believe.

Nor will the Bill do anything to warn the citizen about the records being kept on him or indeed anything else of an active character to prevent abuse. That the Home Office is predicting infinitesmally low take-up of the new access rights should surprise no one.

The Data Protection Bill, assuming it is not derailed by an early election, will not of itself make a great deal of difference to our liberties one way or the other.

UK TELECOMMUNICATION EXPORTS

A crucial test for System X

By Guy de Jonquieres

BY A nice irony, New Delhi, resplendent with monuments to Britain's imperial past, will be the scene this summer of talks which may critically influence the UK's hopes of reversing a quarter-century of steady retreat from the world telecommunications market.

Britain is in the final stages of a campaign to persuade Indian authorities to choose System X, the UK's all-electronic digital telephone exchange, as a major component in the modernisation and expansion of their national telecommunications network.

The Indian contract, for which GEC is bidding against almost a dozen international competitors, would be worth around £100m, with the prospect of more orders later. Plessey also hopes to sell India rural exchanges worth £20m. But large as they are, the prospective orders cannot be measured only in terms of cash.

System X, which is just entering volume production, was conceived at the outset as an internationally saleable product, as well as the mainstay of British Telecom's own network. But so far, it has made only one small overseas sale, worth £2m, for an exchange to be installed by Cable and Wireless on the Caribbean island of St Vincent.

If it is to gain a worthwhile share of overseas markets, it needs a large foreign "reference" order soon to help establish its international credibility. The Government appears prepared to back the Indian bid with bilateral aid worth several tens of millions of pounds.

Financial inducements are common in international telecomunications deals, where politics, financing terms and trade concessions often count for more than the specifications and price of equipment. They are particularly important now, as more than a dozen North American, Western European and Japanese manufacturers battle for survival in an overcrowded market.

Some, like the Dutch Philips group, Europe's largest electronics company, have already concluded that the stakes are too high to continue alone. Philips is pinning its future in public telecommunications to a planned joint venture with American Telephone and Telegraph, which is seeking to expand outside the U.S. for the first time for half a century. Philips is also collaborating with France's CIT Alcatel in private equipment.

Others may soon be forced into similar arrangements. Some industry experts forecast that by the end of this decade, the number of telecommunications companies abla to support a full range of products on their own will be reduced to half-a-dozen or less.

The costs of developing new public exchanges have soared into the same league as for commercial airliners. International Telephone and Telegraph of the U.S. says that developing its new System 12 equipment has cost about $1bn.

British Telecom (BT), which has paid for all the System X programme so far, admits to spending about £300m, with more still needed to see the exchanges into full production. BT recently reduced its exposure by placing all further development on a fixed price basis with GEC and Plessey, which will have to cover any cost overruns out of their own pockets.

Behind these massive budgets lie a sea-change in technology. The latest digital exchanges are powerful special-purpose computers, in which banks of microchips replace all mechanical parts. They can be programmed to provide many additional services, such as redialling and rerouting calls automatically or controlling household security systems.

The real expense is not in manufacturing, where costs and manpower levels have fallen dramatically. It lies in employing armies of skilled designers and engineers to create the thousands of complex computer programs needed to make them work. Because digital exchange designs are tied to the inexorable progress of microelectronics, they must also be continuously updated to remain competitive.

It is generally accepted that manufacturers with less than 5 per cent of the world market for public exchanges, currently worth about $10bn a year, will have difficulty surviving. That apparently modest share may be hard to attain, however. Traditionally, only a quarter of the world market has been open to free competition. Much of it is in the Third World, where many countries have solvency problems.

Outsiders are exclnded from most European countries and Japan by inter-locking relationships between state telecommunications monopolies and favoured national suppliers. AT&T's virtual monopoly has long closed off most of the U.S. market, too. That may change after AT&T is broken up.

Moreover, British manufacturers can no longer count on much allegiance from the many Commonwealth markets which they once dominated. They withdrew from these years ago, opting for a quiet life as suppliers to the British Post Office. Their once secure overseas markets were snatched away by rivals such as Ericsson, which is particularly strong in Australia and Latin America as well as in Scandinavia, and by West Germany's Siemens, which has penetrated many countries in Africa and Asia.

Plessey is staking many of its hopes on the U.S., where it bought the main exchange business of Stromberg-Carlson last year. Mr Desmond Pitcher, managing director of Plessey Telecommunications and Office Systems, estimates that of the $1.5bn market likely to be available to System X in five years' time, only 10 per cent will be outside Britain and the U.S.

Little of the business will be in direct exports. "It's Catch-22," says Mr Pitcher. "The only big markets are those which also insist on making the products themselves." That means that suppliers must make most of their money by setting up local plants, technology transfer, system planning, consultancy and training.

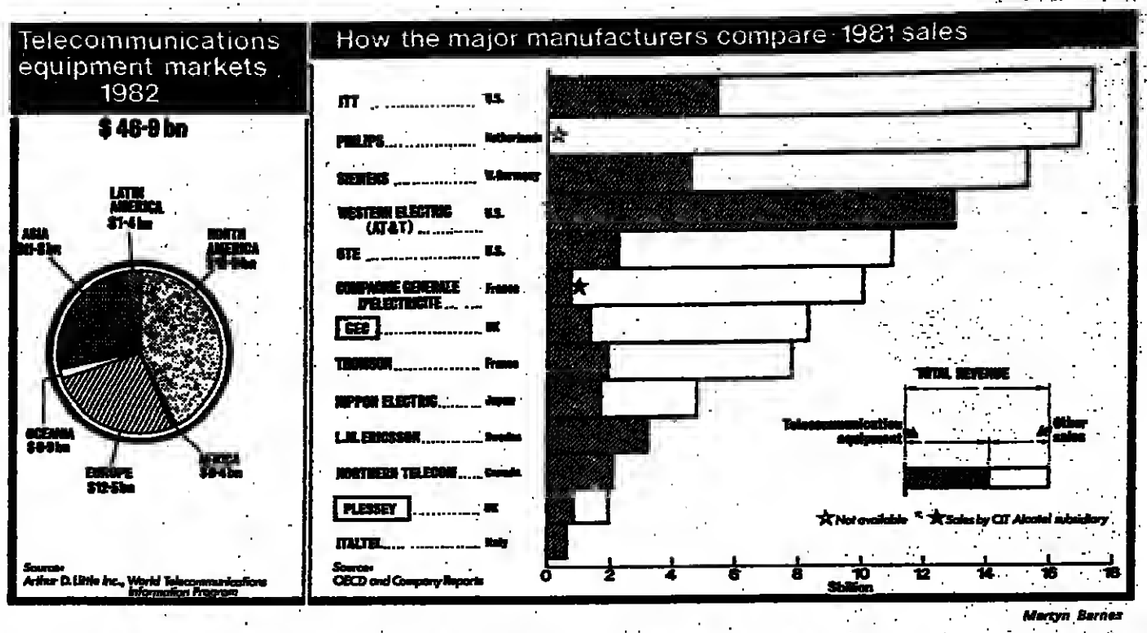
Competition to get in at the start of big telecommunications projects is fierce. The initial contracts are often the key to much bigger follow-on orders.

CIT Alcatel grabbed a large slice of India's telecommunications project last year—even before tenders from the other bidders were opened—thanks to a back-door deal between the French and Indian Governments. Japanese companies are widely accused of "lost-leading" at cut-throat prices. And several suppliers are seeking customers for digital exchanges which still exist only on the drawing board or as prototypes.

Mr John Whyte, BT's engineer-in-chief and progenitor of System X, says that it is technically as good as any of its rivals—though critics claim that it is over-engineered to suit UK standards. BT hopes that foreign sales will provide economies of scale which will reduce the price it pays for System X.

Without overseas orders, it must be asked whether the £300m which British telephone subscribers have already stumped up for System X development can be justified on strict business criteria, when BT could have bought similar technology more cheaply from abroad.

Mr Whyte's answer is that the programme was necessary for Britain to retain the skills and resources needed to compete in the fast-growing world markets for information technology systems in the future. Time will judge whether that decision—and the price required—was right.



A drastic shake-up in production arrangements

FEW BRITISH manufacturing industries have recently been through an upheaval as violent as the shake-up in the production arrangements for System X. As one of those closely involved puts it: "There was blood on the carpet — and all over the walls and ceiling as well."

System X was set up originally as a joint project between British Telecom, GEC, Plessey and Standard Telephones and Cables (STC). All four shared in development, with production split between the three manufacturers. Overseas promotion was entrusted to British Telecommunications Systems (BTS), a joint venture between the four partners.

The arrangement was set up in the mid-1970s, after a gestation period lasting the best part of a decade, in which ideas for the design of System X were chewed over at length. But while British manufacturers were talking, several foreign companies, notably Canada's Northern Telecom, Sweden's L. M. Ericsson and France's CIT Alcatel, were getting on with the job of bringing competing exchanges to the market.

Hopes that the collaborative System X effort would enable Britain to catch up quickly were soon disappointed. With no overall taskmaster, the project began to drift. Delays, mounting costs and other problems aroused bitter mutual recrimination. "It ended up with everybody trying to protect a vested interest," according to a senior executive of one manufacturer.

By early last year, both the Government and BT were growing impatient. In January, Mr Kenneth Baker, Minister for Information Technology at the Industry Department, told the three manufacturers to come up with a better approach.

When they failed to do so, Mr John Whyte, head of BT's major systems division, dropped a bombshell in May. He proposed that just one company should be made responsible for System X and hinted that BT was ready to invite foreign manufacturers to bid for as much as 30 per cent of UK main exchange orders.

The manufacturers were outraged. Lord Weinstock of GEC protested to the Prime Minister. His complaints, however, were answered by some sharp criticism from Mr Patrick Jenkin, the Industry Secretary, of GEC's own past performance in telecommunications. Soon afterwards property developer Mr Jeffrey Sterling, a part-time adviser to Mr Jenkin, was asked to sort out new arrangements.

After heated arguments, during which various proposals to merge the different companies' telecommunications divisions were floated, agreement was finally reached on a new structure. Plessey was made directly responsible for further development of System X, with GEC as subcontractor. The companies have not, however, demonstrated much capacity for mutual affection in the past.

The two companies were to compete in future for production orders. STC was dropped from the programme altogether, but was guaranteed exclusive contracts for five years for the older TXE4/4A exchanges. BTS, which had never been much more than a market research organisation, was wound up, and GEC and Plessey were left to divide the world between them. By the end of last year, the executives in charge of public telecommunications at GEC and STC had both been replaced.

BT has agreed to step up System X orders by 20 per cent. It aims to instal 400,000 trunk lines within the next three years, rising to a peak installation rate of 2.7m lines a year by 1988. Converting the whole UK network will take until well into the next century.

BT has yet to announce the results of the first competitive tenders by GEC and Plessey. But Mr Whyte expects the new arrangements to cut BT's costs and says he is "very encouraged" by trends so far. Until now, BT has paid an average of £350 for each System X exchange line, but is thought to want to reduce that to about £100 in real terms over the next few years.

How far GEC and Plessey will be prepared to cut their margins to gain market share remains to be seen. But BT still has a powerful card in its threat to bring in a foreign manufacturer if they do not perform. The most likely candidate would be L. M. Ericsson, which has already supplied BT with international exchanges and has a joint UK venture with Thorn EMI.

Men & Matters

Apple juice

Apple Computer's young millionaires have bought themselves a new President and Chief Executive Officer.

The Californian company which has made a legendary success out of the development of the personal computer has hired Mr John Sculley, currently president of Pepsi-Cola the giant softs drinks producer, and is reportedly paying him $1m e year in salary and bonuses, together with a signing on fee of $1m and lots of stock options.

Conceding that youthful enthusiasm and technical know-how are not enough to run a company which is now running at an annualised sales rate of $1bn, Apple's President, Mr A. C. (Mike) Markkula will stand down, remaining on the board to concentrate on long-range planning. "I'm much better at planning than I am on the administration side," says the man whose investment of $91,000 in 1976 helped to take Apple out of the garage workshop and iato the big time.

Apple has been looking for a new top executive for some time. "The goal was to find someone better than me," Mr Markkula says. Over the past year, it has becoma clear that the company needed new management and marketing strengths if it was to face down growing competition from IBM and a host of other personal computer makers.

Mr Scully, who is 44 and has spent the past 16 years with Pepsico, does not know much about computers, but he is reckoned by Wall Street to be a whizz at marketing and management. He has earned his spurs in ona of the toughest campaigns in the U.S. consumer business—the cola wars with Coca-Cola. Now he will have to cope not only with a rampaging IBM, but also with a chairman, 28-year-old Steve Jobs, who is one of Apple's co-founders, and its largest individual shareholder.

"I never thought a thousand years of history for a few old Reagan movies a fair cultural exchange anyway."

Spotting winners

Three private sector industrial executives — high-fliers from BP, ICI, and Glaxo — have elected to spend the next couple of years working together as a think-tank for the government.

Their job: to identify where Britain is missing out in the fashionable new patch of biotechnology and so try to pick a few winners for the future.

They have been recruited by the government chemist Dr Ron Coleman who has special responsibility for national support of biotechnology.

Coleman is head of the Laboratory of the Government Chemist, which is part of the Department of Industry, and is also biotechnology adviser to Patrick Jenkin, Industry Secretary, who has appointed himself government spokesman for the subject.

Coleman is delighted with the calibre of executive he has been able to attract to his think-tank. It is his own idea to make sure that UK Limited doesn't miss something good. "One of them is earning £12,000 a year more than me," he grins.

Whitehall has undertaken to pay the salaries of whoever Coleman can persuade to come and work on a two-year secondment—initially in scruffy offices at the end of Waterloo Bridge, but soon in new laboratories in Bushey Park, Teddington.

Tower blocked

Merseyside's international garden festival, to be held in Liverpool's dockland next year to help regenerate the derelict waterfront, is meeting more than its fair share of problems.

The latest is that Basil Bean, chief executive of the Merseyside Development Corporation, the man in charge of the festival, has had to scrap plans for one of the festival's focal points —a £400,000 revolving viewing tower 220-feet high.

He has had to act on safety grounds in spite of the fact that the panoramic views of Liverpool, the Wirral, and North Wales, that it was to offer figure prominently in all the promotional literature.

The festival has already had to put up with a great deal of "jobs-before-flowers" criticism. Also, unforeseen trouble and expense has been incurred piping away methane gas generated by an old rubbish tip that is part of the site.

The English Tourist Board has argued that forecasts of 3m visitors to Merseyside for the show are over-optimistic. And the festival's administration was temporarily interrupted when Sir John Grudgeon resigned as the director two months ago.

The tower has been banned because it cannot meet British safety standards. It was being built in Switzerland for assembly and erection in Liverpool.

A similar tower used at last year's garden festival in Holland was out of action for about one-fifth of the time because of winds.

As the officials considered the westerly gales that so frequently buffet tha banks of the Mersey, they concluded that the tower would be too tender a plant for the Merseyside environment.

Battery charge

A bitter, intricate and bizarre legal tussle is taking place in a Calcutta court. On one side is a disgruntled local sculptor, Sarbani Roy Chowdhury. On the other is the unmoving local subsidiary of UK battery-maker Chloride.

The cause of all the judicial fuss is a sculpture of two bronze birds, commissioned ironically by Chloride India for Rs 40,000 (£2,750) to symbolise the "soaring spirit of co-operation." Chloride liked the birds and wanted another pair to adorn the Manchester building of Chloride Technical.

No agreement was reached over a price for tha second birds. So Chloride India paid Rs 22,000 to the man who cast the originals for a replica from the original mould. But an indignant Roy Chowdhury slapped on an injunction to prevent this going to the UK. The metropolitan court is likely to take several years to resolve the dispute.

Thus oriental disharmony reigns. The birds are gathering dust in a Calcutta police station. Chloride's British head office insists that the matter is a local one. The Indian subsidiary is adamant that it owns cast, mould and copyright. As for Roy Chowdhury, he told "India Today" that the sculpture may not be his greatest, but "no batterywalla can appropriate it without my consent."

Night cap

Did you hear about the chap who chatted up a girl in a pub and tried to talk her into going back to his place for a whisky and sofa?

Eventually he had to settle for a gin and platonic.

Observer

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BRITAIN'S LOCAL ELECTIONS

'Don't take anything for granted'

By Robin Pauley

DANGER. DON'T take anything for granted. That is the common message going out from the political parties to their members in advance of the local government elections on May 5.

The elections come at a crucial time, being almost certainly the parties' last major political test before a general election. Although the polls are supposed to be fought on local issues there is no doubt that they also reflect public sentiment towards the individual parties nationally—especially in years such as this with generally low rate increases.

Mr Tom King, the Environment Secretary, referred recently to next month's elections as "the world's largest opinion poll" and Mr Cecil Parkinson, Tory Party chairman, indicated that the results would be crucial in deciding when to call a general election. An exceptionally good Tory result could persuade the Prime Minister to go to the country in June rather than later.

Yet all the parties are going into the battle with a greater degree of uncertainty about their prospects than in any other recent year. None of the usual rule-of-thumb formulae—past performance, Buggins' turn to do well, by-election swings—are a good touchstone this year. That is because:

- The last elections fought on this year's mix of councils were in 1979, when local polls were held on general election day. That produced an average turnout of 76 per cent, compared with a normal local level of around 40 per cent.
- Local and national boundaries have been redrawn since 1979, altering the political make-up of large numbers of local council wards.
- The Social Democrat Party has been formed and, in alliance with the Liberals, has formed a strong national political third force.
- By-elections and opinion polls have reflected the extreme volatility of large sections of the British electorate, with tactical voting and large proportions of "don't knows" becoming new factors.
- The "Falklands Factor" undoubtedly helped the Conservatives in last year's elections.

All this has combined to make the parties cautious. They have very modest "shopping lists" for gains.

POLLS for 12,652 seats will take place in all 36 English metropolitan districts, all 296 English non-metropolitan districts and all 37 Welsh non-metropolitan districts on May 5. Of these 369 councils, 293 have elections for all seats—50 on the basis of completely new ward boundaries—and in the remaining councils one third of the seat are up for election. There are no county council elections this year, nor polls in Scotland and Greater London.

Of the seats up for election, 5,987 are now held by the Conservatives, 3,480 by the Labour Party, 382 by the Liberals, 165 by the SDP and 2,634 by others. "Others" are mostly independents and "ratepayers." In areas such as Cornwall and Northumberland there is a strong tradition of candidates standing as independents in the belief that party politics are not strictly relevant to local problems. Independents tend to be more akin to the Conservatives than Labour in their attitudes.

At present Labour controls 23 metropolitan districts, the Conservatives eight and five councils are hung, with no overall majority.

Of the English non-metropolitan districts, the Conservatives control 148, Labour 60, Liberals three and Independents 38 with 47 hung. In Wales, Labour and Independents control 15 non-metropolitan districts each, five are hung and the Conservatives control two. Only in the North, North West and Wales does Labour have more seats to lose than the Conservatives. The SDP's biggest tally of council seats is in the North, where it has 34. The party has no seats in Wessex and fewer than 10 in the West, South East, East, West Midlands and Yorkshire. In Wessex, however, the Liberals have their greatest strength—166 seats—and in 80 of these candidates are now designated as "Alliance" ones.

The Conservative Party will be fielding candidates in all the seats in contention and it has hopes of one or two dramatic coups.

The Tories have their sights trained on Darlington (after coming a strong second in the recent parliamentary by-election there), Langbaurgh, Stockton (where both MPs belong to the SDP—Bill Rodgers and Ian Wrigglesworth) and Peterborough, all Labour held. They also hope to take control of several hung councils including Newark, Rugby and Shrewsbury, which also appear on Labour's list of possible wins.

But Conservative Central Office appears to have misjudged one or two seats on its list. Boundary changes have actually helped Labour in Reading, which is currently hung. Although Labour would need to do very well to take overall control, it is doubtful that the Tories can do so either.

The Conservatives are as hopeful as ever about Newcastle-upon-Tyne, where Labour has a majority of four. But Labour managed to hold power throughout the 1970s with tiny majorities and the administration, led by a moderate lawyer, Mr Jeremy Beecham, has persistently proved predictions of its demise to be wrong.

The key contest for both Labour and Conservative this year is Birmingham. The Conservatives snatched control last year from the Labour administration of the moderate Clive Wilkinson (a founder supporter of the SDP before finally deciding to stay in the Labour Party).

The Tories, with a majority of three, have embarked enthusiastically on privatisation and, helped by falling interest rates and the feed-through of economy measures introduced by the previous Labour administration, have cut the city rate for 1983-84 by 12 per cent. The Tories believe their policies will win them the election but Labour hopes they will ultimately mean a shift back to the Socialists.

One of the 3 council seats in each Birmingham ward is up for election — 19 Conservative, 18 Labour and one each Liberal and SDP. Labour would need to win six seats for outright control and this would require an average swing from Tory to Labour of around 7 per cent since last May's elections.

The Labour Party itself admits that it is unlikely to win sufficient seats to gain overall control. If this proves correct, Labour's failure to recapture the capital of the Midlands industrial heartland — despite the ravages of recession and high unemployment—will be a severe psychological set-back for the party.

Nationwide, Labour's list of possible gains is remarkably restrained. The party admits that even if it achieved all of them, the level of support would not translate into a general election victory.

On past form, Labour would have been looking not only to hold every urban council it now controls but also to take over in Bradford, Calderdale, Rochdale and Walsall—all currently hung — and knock the Tories out of overall control in the metropolitan districts of Dudley, Stockport and the Wirral.

In Dudley (40 Tory, 29 Labour, 3 SDP) only 10 of the seats up this year are held by Conservatives which makes it difficult to imagine the party losing control.

Labour needs only one net gain in Rochdale to take control and should manage this. But its most realistic hope in places like Stockport, Walsall and Bradford is a hung council. Labour also hopes to take control of non-metropolitan councils in Peterborough, Cambridge and Crewe, Milton Keynes, Great Yarmouth, Shrewsbury, Rugby, Slough and Brighton are also possibles.

If Labour's modest hopes prove correct, the Liberals and SDP could — with very few seats — emerge as the power brokers in some areas, including Birmingham.

The Alliance is taking a line every bit as cautious as the two major parties. The Liberals will field around 4,000 candidates and the SDP 2,500 — remarkable from a total membership of around 60,000.

The SDP has learned some bitter lessons from last year, when high enthusiasm was not matched by manpower and hard work on the ground. In some places resources were so stretched the party could barely get an election address and a minimal canvass under way. That, coupled with the Falklands, destroyed many of the party's hopes. This year the SDP is targetting carefully rather than trying to hit everything with a scatter gun.

In the southern half of England the aim will be to tempt traditional Labour supporters who feel they have been wasting a vote for years. Good quality council estates and the bottom end of the owner occupier market are prime hunting territory.

In the North, the Labour vote is more solid and the SDP will have to try to dent both Tory and Labour support. The SDP has greater difficulty in penetrating areas run by moderate Labour parties and is going to concentrate more on left-wing councils.

The Liberals, who have larger and better local organisations than the SDP, hope to win 200 seats. They aim to keep hold of Medina (Isle of Wight), Adur in Sussex and Hereford. They are already the controlling party in Liverpool

The Liberals hope to emerge as Liverpool's largest single party but another hung council seems likely.

The Liberals are aiming for minority control in Wyre Forest, Cannock Chase and Pendle. They hope to gain Cheltenham outright and, less realistically, Chelmsford (where they would need to gain nine seats). If they can pick up three seats in Worthing they will take full control. They have a chance as they have had for many years, in Newbury where all 29 Tories, 24 Liberals, one Labour and three other members are up for re-election.

For all the parties this election is not just a matter of gaining or regaining control of local power bases. It will be a full scale test, not only of electoral opinion, but also of party organisation—in preparation for the general election.

The record of exchange rate intervention

By Samuel Brittan

WHENEVER European statesmen are at a loss for worthwhile international economic proposals, they fall back on calls for more intervention in the foreign exchange market. This is basically a non-issue as the authorities of any country are free to intervene at any time they like, if they think they can thereby correct overshooting or undershooting.

Calls for intervention are basically directed at the U.S. (and to Britain during periods when intervention is stopped by the Thatcher-Walters axis). The American authorities deflected the pressure at the last Summit by proposing a study. Of course it is basically inconclusive; but it is already being used behind the scenes for all it is worth by the interventionist lobby.

Meanwhile a paper just published by the Bank for International Settlements offers a good preview of the issues likely to be raised (Official Intervention in the Exchange Markets, by H. Mayer and Hiroo Taguchi). The authors begin by criticising the Friedman criterion of successful official intervention, which is quite simply whether it makes or loses money.

They succeed in showing that it is theoretically possible for certain kinds of slightly unprofitable intervention to be stabilising: for instance when intervention is overdone and more than compensates for the fluctuations which would occur without it. It still remains true that profitable intervention is likely to be stabilising, while unprofitable intervention can have almost any type of effect.

A more serious difficulty is that the apparent profitability of a given act of intervention will depend on the exchange rate prevailing at the time of the evaluation.

The BIS authors try to avoid this difficulty by calculating a 35-month moving average of the mark, yen and sterling exchange rates against the dollar. They identify this average with the underlying equilibrium—although one might query whether even an average of this length is long enough to iron out some of the major departures from the equilibrium in, say, the mark-dollar exchange rate. Central bank intervention which tends to push market rates nearer this underlying trend is regarded as stabilising; the kind that pushes it away is regarded as destabilising.

The BIS brings in a further, more dubious factor by giving credit to the authorities for "leaning against the wind" (LAW). When the market rates are within 5 per cent of the underlying trend, the objective of the authorities is supposed to change towards mitigating any movement in the rate in either direction and their success is judged by the extent they do this.

According to the BIS preferred "hybrid" test, which incorporates all the criteria mentioned, the amount of stabilising intervention for Germany and Japan was six times as much as destabilising intervention over the period 1974 to 1982; but for Britain the ratio was only two to one. If "leaning against the wind" is left out, which is preferable, the results are much less decisive; stabilising intervention was twice as great as destabilising intervention for Germany, four times as much as Japan, but for the UK the ratio was little better than one to one.

The main reason for the UK's relatively unfavourable showing was the intervention of 1977 before Mr Healey decided to "unplug" the pound and let it float upwards. Interestingly enough, the profitability criterion now provides a much more favourable verdict on that intervention. As the table shows, it looked very unprofitable in the years immediately following, when sterling was riding high. As sterling has fallen back the dollars purchased in that year have become more and more valuable. A special updating of the BIS figures for the Finacial Times reveals that when evaluated on March 31, 1983, the intervention of 1977 shows a profit, a finding which will give pleasure to Sir Douglas Wass.

The BIS results demonstrate that central banks have been able on a number of occasions to outguess the foreign exchange market and exert a stabilising influence. The stability is defined strictly in terms of minimising deviations from a trend established by the market itself. It is, therefore, a complete misuse of its results to pretend that they establish a case for "fixed exchange rates" in which national authorities would try to keep the market rate unchanged for long periods at a time.

The exchange rate does have a role as a target for domestic policy for medium-sized countries, but studies of intervention tell us very little either about how that target should be formulated or how it can in practice be achieved.

PROFITS FROM OFFICIAL INTERVENTION

$m, adjusted for cumulative interest rate differentials

United Kingdom Evaluated at end of	Interventions in 1974	1975	1976	1977	1978	1979	1980	1981	1982 (first half)
Dec. 1974	90								
Dec. 1975	−313	−242							
Dec 1976	−753	−595	−162						
Dec. 1977	−221	−147	890	−1278					
Dec. 1978	158	138	1484	−2645	334				
Dec. 1979	872	714	3151	−5174	778	−295			
Dec. 1980	1835	1488	5109	−8553	1371	−925	−185		
Dec. 1981	341	305	2613	−4147	549	142	488	154	
June 1982	−241	−177	1611	−2376	217	580	768	42	−17
March 1983	−1256	−992	−141	708	−355	1308	1220	−96	−149

Source: Bank for International Settlements

Letters to the Editor

An emerging but moderate economic recovery

From the Chief Economist, Capel-Cure Myers

Sir,—Samuel Brittan's case for higher interest rates (March 31) must not go unanswered. Part of his argument rested on the view that sterling was too low when he wrote. This is something on which reasonable men may disagree (and do). But part of it rests on the allegation that real interest rates are *not*, as is commonly supposed, high. He argues this point with reference to a table on different measures of real interest rates faithfully reproduced from the Bank of England Quarterly Bulletin. "The only measures which show reasonably high real interest rates," he says, "are those which relate overdraft or interbank rates to the expected rate of inflation." Once you make allowance for tax factors, however, the real rate becomes negative.

So which of these measures is the more appropriate? Mr Brittan implies that it is the second. It is particularly interesting, however, that on this measure, as Mr Brittan points out, "at no time since 1979 have real interest rates been positive for the representative corporate borrower subject at the margin to corporation tax." But since we know that interest rates (in particular in 1980) were felt by businessmen to be extremely oppressive and were a major factor behind destocking over the period since 1979, one is led to wonder whether this measure means very much.

In fact after-tax measures of real-interest rates are a strange animal. If you measure the costs of borrowing net of tax, you must measure the return on borrowing net of tax; providing the borrower has a tax liability in both periods. If this is done it is not obvious that the after-tax cost of borrowing is so low—low in relation to what?

This point can, perhaps, be made more clearly in relation to labour costs. These are also deductible for tax purposes in that they are chargeable as an expense to profits and thereby reduce a company's tax liability. Does this mean that the marginal real wage is only 48 per cent of its nominal level? Some of Mr Brittan's strictures on the comparison between real wages and marginal product of labour would look rather odd if it did.

The appropriate comparison between costs and returns, however, may be so different from one company to another, depending upon a company's tax position, that the trends in any given measure of real interest rates are probably more instructive than the level. In this context it is interesting to note that the trend of the Bank of England's post-tax real borrowing rate has been more or less continuously upwards over the past year.

Furthermore, these calculations are for prime borrowers. For not so prime corporate borrowers the level of nominal rates would be 2 per cent higher, and for most consumer borrowers much higher still. Reflection on these measures, therefore, argues for further cuts, not increases in nominal interest rates.

Yet there is something of wider importance at stake here. Mr Brittan's article had something of the flavour of dissecting the real interest rate entrails, reminiscent of the way commentators used to discuss "the" money supply. To replace obsession with all the Ms, by obsession with all the Rs would be to proceed in circles. What the experience of the last few years should have taught policy-makers is to beware of placing their faith in monetary indicators, and rather to use them as no more than an adjunct to the evidence of their eyes and ears. It is principally to the state of the real economy that Mrs Thatcher and Sir Geoffrey should be looking when they decide interest rate policy. That, by common consent among forecasters, presents a picture of an emerging, but moderate economic recovery, and in the later part of this year, rising inflation. If interest rates are raised, inflation probably will turn out to be lower next year than it would otherwise have been, but at the cost of a weaker, or even non-existent recovery.

This is the stark choice which faces the Government. Whichever course it chooses, the issue should not be clouded by emphasising the dictates of monetary indicators, whether Ms or Rs, in contrast to the state of the real economy and the thrust of Government policy as a whole.

Roger Bootle,
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The burdens of small business

From the Director, Berkshire Enterprise Agency

Sir,—Those of us engaged in one of Britain's few growth industries, help and advice to the new and small firm, have only gratitude of the efforts on our behalf manifested by Tim Dickson's articles.

Regular readers of the Tuesday Management Page — Small Business — will be familiar with the hurdles confronting these enterprises, and attempts that have been made to ameliorate the burdens of the small business.

The introduction of statutory sick pay is an unwelcome new burden for the small firm. It was, therefore, with relief and delight that I read in the third paragraph of his article on SSP (March 29) that "the small businessman will welcome the change." But strangely the article did not reveal the reason for this assertion.

It did confirm the nightmare of complying with the new arrangements, that "extensive and detailed records have to be kept to show Department of Health and Social Security inspectors," that "substantial fines and penalties can be imposed." Inevitably "small businesses with limited management time and resources" (and that is a very faithful description of the small business) "have been struggling to come to grips with the new requirements." As Tim Dickson points out the employers' guide to statutory sick pay runs to 59 pages.

We do recognise that government, and particularly this Government, has made considerable concessions to the small business.

But the small business and the small businessman require and deserve some more courageous and enterprising steps by government. The raising of the threshold for VAT from £17,000 to £18,000 turnover per annum (or by £19.20 per week) in the Budget can do nothing in the terms of motivation for people to become entrepreneurs or relieving the burdens of administration for the small business. On the contrary. A bold imaginative step of a threshold of £25,000 turnover per annum would not have been a burden to the Exchequer, but would have fired the enthusiasm of the small business man.

Similarly, with SSP, surely the simplifications could be introduced for firms employing less than 20 people.

Ansel Z. Harris,
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The Forbury,
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The Labour Party and NATO

From Mr P. Bunyan

Sir,—Michael Foot has said that Labour's new policy document makes it clear that any future Labour Government would rid Britain of all nuclear weapons and American bases here, yet still remain in Nato. Where is the morality, let alone the political wisdom, of such a policy? How can Labour sustain the morality of unilaterally abandoning nuclear weapons yet support a nuclear strategy of Nato as a whole?

Further, Mr Foot is fond of quoting Norway as one of three (Denmark and Canada as well) Nato members which, although belonging to Nato, do not have nuclear weapons of their own or on their soil. But what Mr Foot omits to mention is that despite all that, these countries, especially Norway and Denmark whose original membership in 1949 was conditional on not having foreign troops or nuclear weapons stationed on their soil, accept the overall nuclear strategy of Nato and, even more important in this argument, pay their contribution to the cost of the infrastructure necessary to such nuclear strategy, including the cost of the installations for the proposed cruise missiles. Canada has agreed to the testing of some component parts of Cruise on Canadian soil.

Mr Foot said his policy would be to change the overall strategy of Nato into being only conventional arms to defend Europe. What will he do if, as is certain, most of the other Nato members do not agree and wish to continue Nato's present policy? Will Britain still stay in Nato? But just suppose they do agree with him, can he really believe that the U.S.A. will forego nuclear weapons even if they do secure an agreement on behalf of the Western Alliance to limit and control them with Russia. If all the European members of Nato relied in future solely on conventional arms how could they accept the protection of America's strength when that military might is based on nuclear weapons? Surely having banished nuclear arms from their own armouries European members would be super-hypocrites if they did. Indeed, where would be the morality of such action?

In addition, if that did happen it would mean, what has long been the political objective of the Soviet Union, that Britain and Western Europe would be detached, "uncoupled" as President Mitterrand had it, from the United States — a catastrophic result for not only the peace and security of Britain, but also of the Western Alliance as a whole.

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FINANCIAL TIMES

Monday April 11 1983

EMPLOYMENT WILL CONTINUE TO FALL IN MANY SECTORS, SAYS REPORT

Bleak jobs forecast for Britain

BY JOHN LLOYD, LABOUR EDITOR, IN LONDON

THERE IS no prospect of an increase in jobs in any of Britain's major industrial or service sectors before the end of the decade, according to a report which is to be presented to government, industry and union leaders today.

The report says that in many areas employment will continue to fall. It also warns that over the same period import penetration is likely to increase while the UK's export competitiveness should decline – unless government and industrial policies undergo a fundamental change.

These exceptionally gloomy predictions are contained in a confidential memorandum by Mr Geoffrey Chandler, the director of the National Economic Development Council (NEDC) which is to be discussed at today's council meeting. The report draws together the assessment – prepared over the past year – of the NEDC's 40 sectoral committees of trends for the medium and long term.

These sectors cover the groupings of consumer markets, manufacturing plant components and systems, industrial intermediates (such as steel and chemicals) and project engineering, infrastructure and public services investment and commercial services investment. Trends in the few groups not covered by NEDC sector committees – such as vehicles – are not thought to show major differences from those covered.

Detailed statistics in the memorandum show declines in employment in all the sectors reporting over the 1975-81 period; increases in import penetration in all but a few, such as food, brewing and agriculture in the same period; and a drop in Britain's share of OECD countries' exports in many sectors – such as electronic consumer goods and capital equipmant, office and construction equipment, machine tools, iron and steel, wool textiles and wine and spirits, between 1975 and 1980. These trends are not, in the main, expected to be reversed.

The memorandum will fuel demands from the Trades Union Congress and some industrialists for a large-scale shift in government policy – especially in the direction, implied in the paper, of increased government assistance and import ceilings in some sectors. The paper also stresses a number of major problems common to all sectors, including:

● A drop in employment, especially in mature industries (textiles, iron and steel, mechanical engineering, for example) but also including growth industries such as electronics because of changing production techniques and improved productivity.

"None of the committees which have reported foresees an increase in employment in its sector up to the end of the decade; continuing productivity improvemeots will be needed in order to maintain sectoral competitiveness, and many committees expect further reductions in employment to take place."

● A lack of skilled personnel in the electronics sector, and general concern over the drop in university and polytechnic places for undergraduates specialising in high technology subjects.

"The provision of technical and vocational training in the UK does not... yet approach that of major competitive countries, and this must be a matter of concern, when the nation's future will depend on innovation, adaptability, design, quality and a range of other factors, all of which are skill-dependent."

● A low level of investment in the past, ascribed to lack of demand and profitability and to high and varying exchange, interest and inflation rates. This is acknowledged to have improved, but the report says that, "if British companies are to be able to compete over the next decade, financial institutions will need to show a clearer understanding of risk/reward ratios and the time scale of risk in high technology projects."

● The crucial factor of application nf new technologies, especially in automated production processes, has been aided by government schemes – but more co-ordinatioo between government and industry, especially in electronics, is urgently required. "The total expenditure on civil R and D is still much less than that of our major competitors, and there remains scope for a more effective balance of expenditure in favour of industry-based products.

● Structural change has been rapid, but over-capacity continues to be an international problem in some sectors. The memorandum says that restructuring must also be international; "otherwise, UK companies may be forced to retrench beyond the point of economic viability."

Further structural change is expected, especially in engineering, to "achieve the size of company, market capability and financial resources sufficient to support investment in modern equipment and enable the development of world market strategies. The consequential specialisation could, however, lead to a permanent reduction in capacity or to the elimination of parts of some engineering product sectors in the UK altogether."

● Government's role is generally thought nf as being too limited. A number of committees, especially in the consumer sector, argue for selective import controls, and most argue for lower energy prices, stable interest and exchange rates, and an increased level of demand.

Rolls cuts U.S. car prices by up to $18,000

By Richard Lambert in New York

THE PRICE of a Rolls-Royce car in the U.S. is to be cut by between $4,000 and $18,000 – the equivalent of roughly three Honda Civics.

As a result, the price of the Silver Spirit – the cheapest car which Rolls sells in the U.S. – is coming down from $111,000 to a modest $83,000, a bargain which is expected to send Texan billionaires and Hollywood film stars stampeding into the showrooms.

The price cut, which has been made possible by the falling value of sterling against the dollar, comes after a poor period for the UK car company's sales in the U.S. Most luxury cars sold surprisingly well in the U.S. last year – Cadillac's business rose by over a tenth, for instance, while Mercedes rose by 7 per cent to over 62,000 vehicles. But retail sales of Rolls-Royce cars in the U.S. fell by over a fifth to just 908 vehicles.

Mr George Lewis, president of Rolls-Royce Motors Inc., the U.S. arm of the company, said that the strength of sterling prior to the collapse in the oil price had helped to push Rolls prices out of line in the marketplace. Traditionally, the car cost about 3½ times the price of the most expensive Cadillac and about 50 per cent more than the priciest Mercedes. "We do well on that kind of relationship," he added.

Recently, however, the car has been selling at more than four times the price of a Cadillac and at about twice that of a Mercedes.

Although unit sales fell sharply in 1982, the actual dollar value of Rolls' wholesale business in the U.S. rose modestly during the year to $101m. "Affordability is the issue," Mr Lewis explained. "Anyone would buy it if they could."

All the same, the decision to cut the price of a status symbol is not one that could have been taken lightly. "It's anything but an everday occurrence," Mr Lewis admitted.

In the past year or so, Rolls has been taking advantage of the weakness in sterling by making discreet offers of incentives to its dealers. As it did not wish to keep changing the retail price, it wanted to see how far down sterling might go before making a public announcement.

Assuming Rolls dealers use anything as vulgar as a price tag, they can now point to what in money terms must surely be the biggest price cut in automotive history.

Mr Lewis said he was "escatic" about the sales outlook following the change. He added that Rolls sold 100 cars a month io 1976, which he said was the last occasion on which it was in the present price relationship with its competitors.

THE LEX COLUMN

Open season for takeovers

Corporate takeovers are back in high fashion in Britain. Already last year acquisitions and mergers in the UK were picking up strongly, with total expenditure in cash and shares doubling to £2.2bn. One unequivocal indication of increased activity emerged in January with talk of the Monopolies and Mergers Commission being overburdened. Its investigations then, involved, among others, brick manufacturer Ibstock Johnsen, for whom both London Brick and Redland had bid; Fitch Lovell, on the receiving end of a Linfood offer; and Anderson Strathclyde, at whom Charter Consolidated had directed its sights.

The Anderson/Charter merger has now gone ahead, while Redland withdrew its Ibstock offer on Friday. But the commission's respite may be brief, at least to judge by recent moves among quoted companies. Quite apart from the UDS bid battle, in the last fortnight Hepworth Ceramic has lunged for Steetley, while on Tuesday BTR made an initial move for Thomas Tilling with a dawn raid.

In part the revival of activity may reflect the weakness of sterling. From 1979 to 1981 acquisition-minded UK companies were taking advantage of the low level of the dollar to buy up U.S. assets. Among the most aggressive purchasers were Grand Metropolitan, Hanson Trust, Unigate and the Imperial Group. The transformation of the currency position has redirected predators' attentions to the UK. Many potential UK victims anyway possess extensive U.S. interests, Tilling being a case in point.

More important is the high level of the London equity market. On a declared tax basis the health and household sector's p/e is now 24, for instance, while that for electricals is 18. But high ratings have been awarded on a very selective basis, producing what has been dubbed a two-tier market. For a company in the first tier, the cost of buying a second division company with paper must appear cheaper than for many years.

In recent months, valuations have started to converge. According to stockbrokers Wood Mackenzie, prices of the top 30 stocks by capitalisation in the industrial group were virtually unchanged in the first quarter, after rising by 43 per cent last year. By contrast, recovery stocks – defined as those which have cut their dividend in the recession – outperformed the FT All-Share index by 15 per cent in the first quarter after underperforming by 20 per cent in 1982.

Targets

So the range of p/e ratios is beginning to narrow, more as prices of first-tier stocks stand still than as those of second-tier companies rise – since these rises have been matched by profits recovery. At the same time predators are probably looking at better results from their own operations. As a consequence they aim to buy in more growth potential before the stock market valuations of possible targets has adjusted. Redland's withdrawal of its Ibstock bid seems to be tacit acknowledgement that it has struck too late to obtain a pre-recovery price.

Bid currency need not be confined to paper. Many companies have succeeded in building up healthy cash piles. Indeed, corporate gearing is particularly low. On stockbrokers' Phillips and Drew's assessment net debt of the average industrial and commercial company may be about 17 per cent of equity, compared with a normal 18 to 26 per cent range. Anyway, abundant institutional liquidity makes it easy for companies to raise cash. In such an environment, it becomes easy to offer an attractive package of cash and shares when making a bid.

It is noticeable that recent takeover moves have involved a number of stocks closely related to the building sector. Ibstock and Steetley are obvious examples, while Tilling has a substantial proportion of its interests in this area. In contrast to some of the troubled engineers, which face foreign competition and a rapidly changing market place, building related equities should enjoy a more reliable upturn in an economic recovery.

The other sector to have seen abnormal activity is retailing. House of Fraser continues to be stalked by Lonrho, the UDS battle is at a climax and Woolworth has found new owners. A common theme is the attraction of buying retailing property assets at a discount to valuation. While such considerations may be an unreliable measure of profit potential, prospects of predator action have sparked a re-rating of several of the poorer performing stores groups on the basis of asset backing. In other sectors too, troubled or dull – but asset-rich – companies have been boosted. In the last two months Burmah's price has risen 39 per cent compared with a 5 per cent increase in the All-Share. Rank is up 19 per cent and BET 25 per cent.

The institutions are much less trigger-happy when it comes to accepting offers. In sharp contrast to the heyday of dawn raids, when a company could pick up 29.9 per cent of anyone for a reasonable premium, BTR managed to trawl only 6 per cent of Tilling last week. But this is likely to reflect the experience that still higher prices emerge later with – or even without – a full bid. Meanwhile the rhetoric of takeover deals often concentrates on management performance, against which defences based on dividend rises and property revaluations may have only limited impact.

At this stage in the cycle any company that cuts its dividend – as Bowater has just done – must be paying particularly close attention to its shareholder register.

Tory push on UK data protection legislation

By Ian Hargreaves in London

BRITAIN's Conservative Government will step up its effort this week to win early parliamentary approval of data protection legislation which it believes will enable the UK to ratify the European convention on data protection.

This would finally remove from British-based companies the threat of being barred from moving electronic data to and from other European countries because of inadequate UK controls on computer records.

The Government hopes that the Data Protectioo Bill, which starts its secood reading in the House of Commons today, can be enacted by the summer recess. It has already been in the House of Lords.

The Labour Opposition, however, plans to introduce a series of amendments to broaden the scope of the legislation.

The bill's main provision is to establish a data protection registrar who, with a staff of about 20, will take details from an estimated 80,000 holders of personal computerised records about the purpose of these data banks and about the people to whom their contents are accessible.

The bill creates for the first time a general right for the individual to inspect his or her own computerised record, although it contains sweeping exemptions from this provision in such areas as national security, police work, taxation and immigration.

The breadth of these exemptions, along with the basic failure of the bill to cover non-computerised records, will be the subject of several Opposition amendments when the bill reaches its committee stage.

Several bodies have attacked elements of the bill, among them the British Medical Association, which argues that the bill will make it more likely that confidential medical information will be passed to the police, whose data banks are likely, for all practical purposes, to be unavailable to scrutiny.

Various legal bodies, however, have attacked the bill from the opposite perspective, on the grounds that it will offer an undesirable degree of access to certain legal files.

Editorial comment, Page 14;
Law report, Page 8

New accounting proposals for Lloyd's come under fire

BY JOHN MOORE, CITY CORRESPONDENT, IN LONDON

NEW RULES for overhauling inadequate accounting standards within the Lloyd's insurance market have provoked opposition from the committee of Lloyd's, one of the ruling bodies of its insurance community.

An internal report on accounting and disclosure within the Lloyd's market is due to be published this week, and has been prepared largely at the prompting of the Department of Trade and the Bank of England, which became worried about the mounting scandal within the Lloyd's market last year. The working party which was formed to prepare the report was originally headed by Mr Ian Hay Davison, Lloyd's chief executive.

Following Mr Davison's appointment as chief executive in January, Mr Ian Plaistowe, a partner in the accountancy and auditing division of accountants Arthur Andersen took over the job.

The objection of the Lloyd's committee, formed of 16 brokers and underwriters who work in the market and which carries out executive work for the Lloyd's ruling council, centres on the amount of disclosure which should be provided by Lloyd's insurance syndicates.

The Plaistowe working party recommended that rules for disclosure of reinsurance business which Lloyd's syndicates arrange with other insurance groups to protect themselves against onerous losses should be modelled on new rules which are to be used by the Department of Trade for insurance companies.

New rules for insurance companies and their reinsurance arrangements were brought into operation earlier this year by the Department of Trade. The rules call for insurance companies to disclose the identity of reinsurers with whi·h they do business if those reinsurers transact a material amount of business with the insurance groups. For instance, if the insurance company passes across 2 per cent or more of its premiums to a reinsurer in the form of reinsurance business, the identity of the reinsurers would be called for.

A similar proposal was suggested by the Plaistowe working party but this has been resisted by the Lloyd's committee on the grounds that it is important that reinsurance transactions remain confidantial.

The other argument of the committee centres around the cost of the exercise. More disclosure, it fears, will lead to increased costs for the Lloyd's market and could place strains on Lloyd's administrative systems.

The other proposals of the Plaistowe report do not appear to have provoked such a violent reaction. In an effort to stamp out bogus reinsurance transactions within the Lloyd's market, which have led to widespread trouble in the market in the last few years, the working party has recommended that underwriters should be required to make a declaration that the premiums paid to reinsurers are commensurate with the underlying risk which is being reinsured.

Underwriters should be required to disclose their gross premiums and gross insurance claims to underwriting members who form their insurance syndicates, rather than stating the items net of the payment of reinsurances, argues the working party. This is to ensure that members of Lloyd's can see how much of their revenues are being paid out in reinsurance.

Moreover, underwriters will have to disclose all reinsurance business which they are using for tax avoidance purposes to the Lloyd's authorities.

A rollover fund can be established with a reinsurance group offshore to reduce the level of taxable profits of underwriting members in the UK by creating a tax deductible premium cost. A contractual arrangement can be established with the reinsurer for the repayment of the premium in the following tax year. Under this arrangement, in the event of no reinsurance claim or after the deduction of whatever claims arise the premiums are paid back to the syndicate in the following year.

The new measures of the Plaistowe working party are designed also to stamp out another practice.

Some Lloyd's underwriters use reinsurance to disguise the amount of business which they are handling in the market, laying off large parts of their own premiums with reinsurers to conceal their business volumes, and remain within business limits set down by Lloyd's.

Controversy over census

Continued from Page 1

ture (which needs no names) and "filling gaps in the register of inhabitants" (which does). The Interior Ministry has promised thet the names will be separated from the answers and destroyed, and thet the special "data protection" unit at the ministry will prevent misuse of the answers by police and other authorities.

But the city council of Munich has already offered census takers DM 2.50 for every non-registered person they find and double that amount for finding a foreigner.

Germans, like everyone else, usually have something to hide even if it is just an extra bit of rent not declared to the tax authorities. But even the blameless will find that the authorities have devised a form that fits no standard German envelope and Frau Müller, the public-spirited census taker from the corner shop, will be able to confirm what she had always suspected: that Sigrid buys her leg-warmers out of dole money and young Holger lives with a friend.

Congress to debate bank lending

Continued from Page 1

ments have fallen six months or more in arrears will be deemed reservable, subject to a number of other conditions.

Loans "to a country unable to meet its external debt service obligations" but on which interest is still being paid will be deemed "debt service impaired," unless the country is renegotiating its obligations or adopting an IMF or other "suitable economic adjustment programme."

In addition, bank examiners will be expected to comment on the general degree of the bank's country risk exposure and will consider concentration of specific risks as a factor in judging a bank's capital adequacy.

● New disclosure rules will be imposed on all banks, requiring uniform reporting of all country risks greater than ¾ per cent of a bank's total assets. In addition, banks will have to report their exposures to the regulatory authorities on a quarterly basis, instead of every six months.

● Specific loss reserves will be required for loans declared "reservable" under the new risk classification. All interest payments on such loans will be used to reduce the principal or add to the reserves and will not be credited to a bank's income. The initial provision for reservable loans will normally be 10 per cent, and will be reviewed annually.

● Fees received by banks in rescheduling agreements will be amortised over the life of the new loan, instead of being added to current income. The only exception will be for that proportion of a fee which is clearly a reimbursement of a bank's current expenses in carrying out a rescheduling.

● The U.S. regulators will improve co-ordination with monetary authorities in other countries and with the IMF. The report calls on the IMF to comment on its member countries' banking exposure and to "consider" making these comments available to international banks and the public.

World Weather

		°C	°F			°C	°F			°C	°F			°C	°F
Algeria	S	17	63	Dubrovnik	S	18	64	Malaga	S	21	70	Salzburg	C	12	54
Ajaccio	F	19	66	Faro	S	21	70	Malta	S	21	70	Seoul	S	26	79
Algiers	S	25	77	Florence	F	18	64	Manila	-	—	—	Singapore	S	34	93
Amsterdam	R	9	48	Frankfurt	C	9	48	Miami	F	25	77	Stockholm	C	8	46
Athens	S	21	70	Funchal	F	18	64	Milan	C	17	63	Strasbourg	R	14	57
Bahrain	S	25	77	Geneva	F	21	70	Moscow	C	5	41	Sydney	C	24	75
Bangkok	-	—	—	Gibraltar	Fg	19	66	Munich	C	13	55	Taipei	-	—	—
Barcelona	S	19	66	Guernsey	F	11	52	Nairobi	-	—	—	Tangier	S	25	77
Beirut	S	18	64	Helsinki	C	4	39	Naples	F	17	63	Tehran	-	—	—
Belgrade	S	21	70	H. Kong	C	20	70	New Delhi	-	—	—	Tel Aviv	-	—	—
Berlin	F	12	54	Innsbruck	F	18	66	New York	R	7	45	Tenerife	S	22	72
Biarritz	S	20	68	Inverness	F	9	41	Nice	C	15	59	Tokyo	R	16	61
Blackpool	C	5	41	Istanbul	S	16	61	Oporto	Fg	14	57	Toronto	R	6	43
Bordeaux	S	20	68	Jersey	F	12	54	Oslo	F	8	46	Tunis	S	24	75
Brussels	C	15	59	Jo'burg	S	17	63	Paris	C	16	61	Valencia	S	29	84
Budapest	C	15	59	Las Palmas	S	21	70	Prague	D	9	48	Venice	F	16	61
B. Aires	-	—	—	Lima	-	—	—	Reykjavik	C	3	37	Vienna	S	13	55
Cairo	S	23	73	Lisbon	F	15	59	Rio de J'o	-	—	—	Warsaw	F	11	52
Cape Town	S	28	82	Locarno	C	14	57	Rome	F	17	63	Zurich	F	16	61
Caracas	-	—	—	London	C	13	55								
S-Casablanca	S	26	79	Los Angeles	C	13	55								
Copenhagen	C	8	46	Luxembourg	C	14	57								
Corfu	S	20	68	Madrid	S	23	73								
Dublin	S	5	41	Majorca	S	28	88								

Readings at mid-day yesterday.

C-Cloudy D-Drizzle F-Fair Fg-Fog H-Hail R-Rain S-Sun Sl-Sleet Sn-Snow T-Thunder

Jordan calls off PLO talks

Continued from Page 1

Said al-Feisal, the Saudi Foreign Minister, Mr Pym made it clear that the British Government would be willing to sanction a meeting between a junior minister and a top official of the PLO.

Mr Sartawi, based in Paris, was regarded as the PLO's leading expert on European affairs. After his assassination, a letter he had sent to Herr Willy Brandt, the former West German Chancellor, who is President of the Socialist International, was read out to the delegates.

"At the centre of the Middle East conflict stand the Palestinian people with their legitimate claims to their inalienable right to self-determination, their right to establish a state of their own," the letter said.

It also referred to PLO attempts to gain recognition from the Socialist International and listed examples of PLO moderation in recent years.

Mr Sartawi was often described as a roving ambassador for the Palestinian organisation and a man believed close to Mr Arafat.

He was jointly awarded a peace prize in 1979 by Chancellor Bruno Kreisky of Austria for his efforts to foster Israel-Palestine peace, together with Mr Lovya Eliav, a former secretary-general of the Israeli Labour Party. Mr Eliav said yesterday that during meetings with the PLO leader he had learned that Mr Sartawi "knew that he was in mortal danger"

The gunman, described as being in his thirties, was pursued from the hotel by security guards but escaped over a wall.

Abu Nidal, who left the PLO in 1974, has since been sentenced to death in absentia by the PLO. His followers have also claimed responsibility for last year's attempt on the life of Mr Shlomo Argov, the Israeli Ambassador to Britain.

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SECTION II – INTERNATIONAL COMPANIES

FINANCIAL TIMES

Monday April 11 1983

West German bond market adopts a holding pattern

BY STEWART FLEMING IN FRANKFURT

WHEN THE Bundesbank took the financial markets by surprise on March 17 by announcing a cut of a full percentage point in both its leading interest rates, the discount and the Lombard rate, investors began to ask themselves if they were witnessing the end of the bull market in the fixed interest sector.

The central bank's moves brought the discount rate down to 4 per cent and the Lombard rate down to 5 per cent, levels last seen at the beginning of 1979.

The long downward trend in West German rates began in September

U.S. INTEREST RATES (%)

	Week ending April 8	March 31
Fed funds weekly aver	9.42	8.88
3-month Treas bills	8.56	8.01
3-month CDs	9.04	8.99
30-years Treas. bond	10.72	10.55
AAA Utility	11.86	11.88
AA Industrial	11.65	11.63

Source: Salomon Bros. Fed and FT estimates in the week ending March 30. M1 fell by $100m to $497.1bn

Full U.S. bond report, Page 16

and October of 1981 when bond yields peaked at close to the 12 per cent level, and the "special Lombard" rate, which had been in force since February 1981, was also cut from 12 per cent to 11 per cent.

As the central bank last month took its bold initiative aimed at giving the domestic economy as much help as possible, average yields on government securities were down to the 7.27 per cent level. Shrewd investors had thus enjoyed a bond market rally of almost five percentage points.

The main factors behind the rally are well known. The West German current account had turned around from a world record deficit of DM 29bn ($12bn) in 1980 to a healthy surplus of DM 8bn in 1982 with expectations high that 1983's surplus would be even bigger. Domestic inflation had been cut from over 6 per cent to nearer 3 per cent in the last six months at an annual rate. The D-Mark had recovered its attractions as an international currency, with speculative inflows of capital replacing speculative outflows and contributing to the stock market rally.

There is evidence, however, that the bond market had, by March of this year, already taken account of these positive factors. Since March 17, bond prices have fallen back slightly despite the decline in interest rates in the short-term money markets.

This week average yields on medium-term government issues have been around the 7.38 per cent level, back to the levels which were ruling on the day that Chancellor Helmut Kohl's centre-right coalition Government was re-elected on a platform which promised, among other things, more discipline in government finances.

The course corrections since early March probably reflect profit taking and in the past few days renewed unease about U.S. interest rate trends. A wage settlement in the metal industries of 3.2 per cent and falling oil prices have not led to any renewed enthusiasm on the part of fixed interest investors.

The market has now adopted a holding pattern. There are those who say that further declines in the domestic inflation rate, a rally on the U.S. bond market and a strengthening of the D-Mark against the dollar could contribute to renewed gains in German bond prices. But even the optimists doubt whether yields will fall below the 7 per cent level if the economic cycle develops as most predictions are suggesting, namely with an economic upswing later this year.

However, the risks of a change in mood, of a rise rather than a fall in U.S. interest rates, of a more critical judgment of the rapid growth of the domestic monetary indicators, for example, have to be taken seriously.

The risk-reward ratio in the West German bond market is now heavily tilted in favour of caution.

INTERNATIONAL CAPITAL MARKETS

An air of unreality

BY PETER MONTAGNON, EUROMARKETS CORRESPONDENT, IN LONDON

WITH SNOW falling in London last week it was hard to believe that spring had arrived. There was a similar air of unreality in the bond markets, which hardly moved despite a background of gently falling interest rates.

The six month Eurodollar rate closed the week at about 9⅝ per cent, down ¼ point, and in the U.S. the key short-term Federal Funds rate also finished lower at about 9 per cent compared with its pre-Easter peak of 10¾. Yet fixed rate dollar bonds edged up only about ½ point in lacklustre trading and there were only four new fixed rate issues, all of which were interest rate swaps arranged for banks.

Despite the firmer undertone it seems that investors are hardly rushing back into the bond market. Some may not yet have got their feet firmly back under the table after the Easter holiday, some may still be concentrating on equity markets, and where demand for bonds exists it may have been used by traders to offload inventory without pushing prices up very much. But the most important factor seems to be that the bond markets are still waiting for a more decisive signal on interest rate trends.

If the Federal Funds rate fell clearly below 9 per cent, the market could perhaps come back to life, some bankers argue. It would be helped also by the appearance of some high quality corporate borrowers rather than the monotonous diet of bank paper on offer last week.

This is not to say that last week's issues fared all that badly. One, the 10 per cent issue for UBS, was a runaway success, mainly because the borrower's own in-house placing power is so large that other underwriters had to be substantially scaled back. This created a shortage of the paper in the market so that on Friday the bonds were quoted at a premium of one point over their par issue price.

The last of the four bank issues, the $75m, seven year, 11 per cent bullet issue for Canadian Imperial Bank of Commerce, was launched on Friday, too late to attract market attention. Of the remaining three, the least popular was the $50m, 11½ per cent issue for Austria's Genossenschaftliche Zentralbank, a bank with a relatively small international profile. Even that, however, was trading at a respectable discount of 1¾ points on Friday afternoon.

Other major bond markets remain similarly unconvinced about the likely trend of interest rates, with only modest gains recorded in secondary market trading of Swiss franc and D-Mark bonds. In both countries the primary market is relatively receptive to new issues at the right price and from the right borrower. But the Swiss market is still reeling from an apparently unstoppable flow of private placements from little known Japanese companies.

Some of these placements are evidently not being readily sold in the market, and the overhang of paper is acting as a dampener to the market for public issues of which only two were launched last week, for DG Bank and Sekisui House.

In Germany the DM 200m issue for the Province of Quebec met a positive reception despite its large size, trading on Friday at a discount of ⅜ points. Its performance set the tone for the DM 200m issue for the Province of Manitoba bond launched on Friday through WestLB at the slightly lower coupon of 7¾ per cent over ten years.

Argentine interest arrears cause delay to $1.5bn loan

BY JIMMY BURNS IN BUENOS AIRES AND PETER MONTAGNON IN LONDON

THE COMPLETION of Argentina's planned $1.5bn loan from its commercial bank creditors now looks likely to be delayed further as a number of key obstacles to overcoming its $39bn debt problems remain unresolved.

Over the last month leading Argentine officials including Sr Jorge Wehbe, the Finance Minister, and Sr Julin Gonzales del Solar, the central bank governor, have publicly insisted that negotiations are nearly complete on outstanding aspects of the loan designed to help Argentina over its liquidity problems.

But privately bankers in Buenos Aires said last week that the loan, previously expected to be completed at the end of this month, may not now be signed before May at the earliest.

Not least of these problems is the question of arrears on public sector interest payments which Argentina has been trying to bring up to date. The arrears arose because of an internal dispute over how public sector entities were to be provided with the pesos needed to purchase the dollars for debt service from the Argentine central bank.

They have already caused a delay in the disbursement of the final $300m tranche of the $1.1bn bridging loan arranged for Argentina by its commercial bank creditors earlier this year.

Argentine officials met their leading creditor banks in New York on Friday in an effort to set a timetable for payment of the arrears, but a number of other problems remain which are hampering progress on resolution of the country's debt problems.

One of these is the central bank's reluctance to define conditions for the settlement of some $1.4bn of short-term private sector debt which was due to be repaid last month. Residual strains also exist in Argentina's relations with UK banks, both as regards final agreement of the rollover of $440m in principal repayments that fell due during the Falklands crisis and the inability of UK banks, including Lloyds, to repatriate profits from Argentina.

Some foreign banks are also upset by the way in which the liquidation of Argentina's paper manufacturer Celulosa Argentina is being handled. Foreign creditors whose loans amount to some $150m have been told that they will be subordinated to domestic creditors

Argentina's failure so far to draw on its $500m credit from the Bank for International Settlements has caused some surprise to foreign bankers. It is thought that drawings may have been impeded by continuing problems over collateral, but other bankers point out that Argentina is far from bereft of foreign exchange resources at the moment.

In this respect it differs markedly from some other Latin American countries, notably Brazil, which continues to face foreign exchange liquidity tightness despite the rapid improvement in its foreign trade.

Brazil's first quarter trade surplus of $844m was the result of a $1bn fall in imports to $3.8bn compared with the same period last year (exports also fell by $200m over the same period).

With imports running at these low levels it is hard for Brazil to draw fully on the $10.3bn in short-term trade credits made available under its debt rescue package.

Yet Sr Carlos Langoni, central bank governor, was reported on Friday as telling Brazilian journalists that Brazil needed to use this facility as well as the interbank market to boost its liquidity by a further $3bn.

CURRENT INTERNATIONAL BOND ISSUES

Borrowers	Amount m.	Maturity	Av. life years	Coupon %	Price	Lead Manager	Offer yield %
U.S. DOLLARS							
UBS Fin. ‡	100	1988	5	10	100	UBS Secs., Morgan Stanley	10.000
IBJ Fin. ‡	100	1988	5	10⅜	100	IBJ Intl., SG Warburg, Morgan Stanley	10.875
GZB ‡	50	1990	7	11½	100	SG Warburg	11.500
Copper Lake Fin. §¶	20	1993	10	0¼	100	Euro-Canadian Secs.	*
CIBC ‡	75	1990	7	11	100	CSFB	11.000
Forsta Sparbanken †‡	40	1990	7	5¼∅	100	Manfrs. Hanover, Svenska Handelsbkn.	–
CANADIAN DOLLARS							
City of Montral ‡	50	1991	8	12¼	100	Société Générale	12.250
D-MARKS							
Quebec Prov. ‡	200	1991	8	7½	100	Commerzbank	7.500
Kubota	100	1990	6	7⅜	*	West LB	*
Manitoba Prov. ‡	200	1993	10	7⅛	100	West LB	7.375
SWISS FRANCS							
Sumitomo Construction **§‡	30	1988	–	4½	100	CS	4.125
DG Bank ‡	70	1991	–	5⅛	99¾	Handelsbank	5.414
Nissin **‡	20	1988	–	6⅛	100	CS	6.125

Borrowers	Amount m.	Maturity	Av. life years	Coupon %	Price	Lead Manager	Offer yield %
Tsubakimoto Chain **§‡	30	1988	–	4½	100	UBS	4.125
Nippon Reizo **‡	20	1988	–	6	99½	UBS	6.119
Sonoike Mfg. Co. **§	25	1988	–	4½	100	Handelsbank	*
Fuji & Co. **‡	20	1988	–	6⅛	100	Bque. Morgan Grenfell en Suisse	6.125
Nippon Shokubai **‡	50	1988	–	6	99½	UBS	6.119
Sanyo Special Steel **‡	50	1988	–	6	99½	SBC	6.119
Takasago Corpn. **¶	20	1988	–	5⅜	100	Paribas (Suisse)	*
Sekisui House	100	1995	–	*	*	UBS	*
World Bank **‡	150	1987	–	5¼	100	SBC	5.250
World Bank **‡	100	1989	–	5¾	100	SBC	5.750
Aoki Construction **	20	1988	–	6	99½	Swiss Volkshank	*
STERLING							
EIB ‡	50	1991	8	11¾	100	Hambros Bank	11.750
GUILDERS							
Credit Foncier	100	1993	10	8½	*	Ned. Middenstandsbk., Amro Bank, ABN	*
ECUs							
Credit National	50	1993	10	12¼	*	Credit lyonnais, Kredietbank Lux., BNP	*
YEN							
World Bank ‡	20bn	1995	10.32	8	00½	Daiwa Secs.	8.228

* Not yet priced. ‡‡ Final terms. ** Placement. † Floating rate note. ∅ Minimum. § Convertible. ¶ With warrants. †† Registered with U.S. Securities and Exchange Commission. Note: Yields are calculated on AIBD basis.

INTERNATIONAL CAPITAL MARKETS AND COMPANIES

U.S. BONDS

Investors nervous despite signs of lower rates

The U.S. bond market is still hoping that interest rates are set firmly on a downward track, but is waiting anxiously for official confirmation, which explained the uncertain mood of last week.

On Monday the markets marked time. The previous week's money supply figures had done little to quell investors' concern about the direction of U.S. Federal Reserve policy. Some analysts have detected a slight tightening in Fed policy which, they said, reflected a need to curb the recent rapid growth in money supply and reassure investors that the Fed's number-one priority was to fight inflation.

Others were less sure and argued that the Fed had not changed its policy and its main priority continued to be to keep interest rates low to ensure that the economic recovery did not abort.

On Tuesday the debt markets sprang to life after a newspaper report quoting a senior Fed official (the markets promptly assumed it was Mr Paul Volcker, chairman of the Federal Reserve) who said he thought that inflationary pressures had subsided sufficiently to justify a drop in long-term interest rates.

Bond prices jumped by over a point and short-term interest rates moved lower. The rate on the U.S. Treasury's latest 13-week Treasury Bill issue, which had already eased to 8.66 per cent at the weekly auction, fell to under 8.50 per cent, while several brokerage houses took advantage of the market's new found confidence to launch debt offerings for municipal and corporate clients.

In the government sector the Treasury 10⅜ per cent 2012 stock, closed over a point higher at 98¾.

However, the market's enthusiasm evaporated on Thursday when the Fed funds rate stubbornly refused to fall. Fed funds had already moved sharply higher as a result of technical factors associated with the end of the first quarter, but as these abated analysts had expected the rate to drop back to under 8¾ per cent from its level of around 9¼ per cent earlier in the week.

Its failure to act accordingly unnerved the markets and even comments by Mr Martin Feldstein, chairman of the Council of Economic Advisors, who said on Wednesday that the Federal Reserve had not tightened monetary policy, failed to reassure nervous investors.

By the end of the week, however, the debt markets appeared to have recovered their spirits, helped partly by better-than-expected money supply figures—M1 fell by $100m in the week ended March 30. By the close of business on Friday the Fed funds rate had traded down to 8½ per cent and the Treasury long bond had risen by more than a quarter point.

Market analysts are hoping that the latest figures are evidence that the expected slow-down in monetary aggregates is occurring. However, they are holding fire until they hear what Mr Paul Volcker has to say about the Fed's monetary policy to the Senate Banking Committee tomorrow.

Despite the uncertainty about the market's direction the pace of corporate and municipal debt issues has accelerated taking advantage of the lack of new Treasury issues. A $3.9bn offering of New York State tax and revenue anticipation notes was oversubscribed and the net interest cost to the state was the lowest for four years at 6.174 per cent.

In the corporate sector Southern Bell Telephone and Telegraph Company, part of ATT, raised some $200m of 11¾ per cent 40-year debentures priced at 98.875 to yield 11.885 per cent.

William Hall

U.S. INTEREST RATES

	Week to April 8	Week to Mar 31
Fed funds wkly aver	8.43	8.88
3-month T-bills	8.55	8.61
3-month CDs	9.04	8.99
30-year Treas bond	10.73	10.85
AAA Utility	11.88	11.88
AA Industrial	11.45	11.63

Source: Salomon Bros. (estimates). In the week ended March 30 M1 fell by $100m to $487.1bn.

Operating result recovers at German merchant bank

BY STEWART FLEMING IN FRANKFURT

BERLINER Handels-und Frankfurter Bank (BHF Bank), West Germany's largest merchant bank with total assets of DM 21bn, reports a sharp recovery in operating profits for 1982.

In common with other commercial and merchant banks in Germany, BHF has benefited from falling interest rates in both its lending and securities dealing operations. Interest earnings by the group rose from DM 263.4m to DM 333.8m.

Partial operating earnings including commission income of DM 83.3m, and deducting operating expenses of DM 229.7m were DM 187.5m, up from DM 116.2m in 1981.

For the parent bank, which has assets of DM 9.1bn, the company reported an increase in operating profits from DM 62m to DM 118m. However, full operating earnings, including securities income, increased more sharply.

At both the parent bank and group level, the bank has been forced to make substantial write-offs as a result of loan losses and has made provisions against potential loan losses. Group provisions increased from DM 86m to DM 177m. At the parent bank level, the increase is from DM 43m to DM 110.2m.

Among loan losses it has had to account for is a write-off as a result of its involvement in AEG-Telefunken, which the bank says was its biggest ever loan loss.

BHF is a wholesale bank without retail banking operations and is thus heavily dependent on money market financing. As a result it has profited from the sharp fall in interest rates over the past year. It is also one of the leading West German issuing and securities trading houses and its operations in this area too have been highly profitable in a period of heavy stock and bond market trading.

In common with its competitors, the bank has been cautiously avoiding the expansion of its balance sheet in a period of weak loan demand and tightening equity capital regulations.

Overseas Union Bank lifts profit

By Georgie Lee in Singapore

OVERSEAS Union Bank, one of the big four Singapore banks, has posted a 12 per cent improvement in group net profit to $59.3m for 1982. Post-tax profits of the parent bank rose less rapidly, up by 7 per cent to S$47.5m.

The group proposes a final gross dividend of 6 per cent, making an unchanged total of 16 per cent for the year.

● Commercial Bank of Korea, the major commercial bank, had one of its worst years in 1982, principally due to a severe cut in regulated domestic interest rates at midyear. *Ann Charters reports from Seoul.*

Although total assets grew 10 per cent to $10.5bn, net income fell from $42m to $13.5m.

Cheung Kong shares for trading partner

BY ANDREW FISHER IN HONG KONG

THE DEPRESSED state of the Hong Kong property market has prompted Cheung Kong Holdings, a major company in the sector, to buy out its partner in a big industrial site.

Cheung Kong will issue shares worth HK$227m ($34m) to Green Island Cement, its associate in the development project at Hunghom on the Colony's mainland near the airport and waterfront.

The 24.58m shares will be issued at HK$9.25 each and personally guaranteed for 14 months at this price by Mr Li Ka-Shing, chairman of Cheung Kong. The issue will save Cheung Kong some HK$90m, as further project payments of HK$317m were due to Green Island by October 1986.

Cheung Kong's announcement of the deal came shortly after it reported sharply lower net profits for 1982 of HK$534m against HK$1.6bn after making provisions totalling HK$637m on the lower value of its landbank and holdings in other development companies.

The group already owns 40 per cent of Green Island, which itself recently announced much lower 1982 earnings. The value of the share issue represents the amount due to Green Island for the Hunghom site after discounting annual interest of 12 per cent up to October 1986.

The share issues will give Green Island just over six per cent of the Cheung Kong equity.

INTERNATIONAL APPOINTMENTS

Chairman elected at Caltex

● Mr Howard V. Yergin has been elected chairman of the board and chief executive officer of CALTEX PETROLEUM CORP. effective August 1. Mr Raymond F. Johnson, a senior vice-president of Caltex, will succeed Mr Yergin as president. Mr Yergin will succeed Mr William E. Tucker, chairman and chief executive since November, 1981, who retires on August 1. A new office of the chairman has also been established. It will be composed of Mr Yergin as chairman, Mr Johnson as president and Mr Seymour S. Miller, senior vice-president and a director of the company. The office will be responsible for matters affecting long-range conduct of the company's business.

● Mr Robert Cosby, assistant director of Guinness Mahon and Co, has been appointed managing director of PEOPLE'S MERCHANT BANK in Sri Lanka, a joint venture between People's Bank in Sri Lanka and Guinness Mahon in London.

● TRI BASIN RESOURCES, Canadian-based oil and gas company trading in London under Rule 163, has reorganised its officers and directors. Four of the existing directors have resigned and six additional directors have been appointed. The reconstituted board is as follows: Mr Murray Pezim (chairman); Mr Arthur Clemiss (president); Mr Gilbert Gertner, Mr Stuart Lewis; Mr Robert Barbero; Mr Anthony Feimann; Mr Raymond A. McLean, Mr Dick Groot and Mr G. Arnold Armstrong. Ms Eleanor Keays has been appointed secretary.

● The board of ALLIED CORP has elected Bendix Corp officers, in a move representing the beginning of the process to combine the Allied and Bendix corporate staffs. Mr William C. Purple, Bendix executive vice-president and president of its aerospace/electronics group was named group vice-president, while retaining his current post. Mr J. Mason Reynolds remains president of Bendix Automotive Group. Mr Frederick W. Searby remains president of Bendix Industrial Group, and becomes group vice-president. Mr John W. Weil, Bendix senior vice-president and chief technical officer, was named vice-president of advanced technology and engineering. As part of the restructuring of Allied's finance department Mr Nicholas A. Cameron was elected vice-president of planning and development. He succeeds Mr Pieter J. Schiller, who was elected vice-president responsible for carrying out the Allied/Bendix consolidation. Mr Donald R. Kayser, senior vice-president and chief financial officer, was named vice-president of finance, succeeding Mr Cameron.

● Mr Albert Benezra has been elected a director and senior vice-chairman of the AMERICAN EXPRESS INTERNATIONAL BANKING CORP (AEIBC) — which recently combined operations with the non-U.S. banking business of Trade Development Bank Holding SA (TDBH). Mr Benezra, who has been with TDBH for 21 years, was also named chief credit officer of AEIBC worldwide. He will continue as general manager of Trade Development Bank, Geneva, a post he'd held for 12 years. Mr Robert A. Savage has been elected a director and vice-chairman of AEIBC. He most recently served as treasurer and executive vice-president.

Mr Albert Benezra, senior vice chairman of American Express International Banking Corp

● CREDIT COMMERCIAL DE FRANCE has appointed M Charles de Croisset to head its international department. He will assume the responsibilities of M Jean de Roquefeuil, deputy general manager, who will cease to work full time for the bank from June 30. He has expressed his wish to leave CCF to head a new bank in Luxembourg but will remain with CCF in a part-time advisory position.

● Three appointments have been made in the space systems operation at FORD AEROSPACE AND COMMUNICATIONS CORP's western development laboratories division. Mr Eugene T. Jilg has been named deputy director, advanced programs and technology, a new position. He was deputy director, programmes. Mr Jack E. Richards, formerly manager, of the INTELSAT V/VA programme, has been named deputy director, programmes, succeeding Mr Jilg. Mr Louis J. Bruno, formerly deputy manager of the INTELSAT V/VA programme, has been appointed manager, replacing Mr Richards.

● BANKERS TRUST COMPANY, New York, has appointed Mr D. Thomas Abbott, vice-president, as its new representative in Amsterdam. He assumes market management responsibility for Dutch financial institutions and corporate clients of the bank's international department. He replaces Mr Walter A. Marlowe, vice-president, who is transferring to the London office, to take charge of corporate business in southern England and Scandinavia within the north Europe group. Mr Willem Van Aalst, assistant treasurer, has been assigned to Amsterdam as business relationship manager. The company has just opened a representative office in Cairo, where Mr Peter H. Johnson, vice-president, has been appointed as representative.

● Mr Zeno Schindler has been appointed chairman, and Dr Peter Weichhardt and Mr Johann Georg Hartmann members of the newly-formed group management committee of SCHINDLER HOLDING, the Swiss-based parent company of the Schindler Lifts Group. Mr Schindler remains managing director but leaves the actual group management, which will now be headed by Dr Wichhardt as chairman.

● Mr S. D. de Bree has been appointed executive vice-president in charge of DSM's plastics division, from June 1, when Mr A. H. P. Grotens (whom he succeeds) will join NV Nederlandse Gasunie, to become president on May 1 1984.

● Mr Dietrich Forcart, partner of Bank La Roche and Co, has succeeded Prof Hans Guth, chairman of Dreyfus Soehne and Cie, as chairman of the BASLE STOCK EXCHANGE.

● Mr Helmut Sohmen has been appointed senior vice-chairman of WORLD-WIDE SHIPPING AGENCY, in Hong Kong, part of Sir Yue-Kong Pao's World-Wide Shipping Group. Mr Stephen Y. K. Pan has been appointed as senior executive director of World-Wide Shipping Agency, and also as a director of Marine Navigation Company, the group's affiliates in London.

● Mr Ghassan Al-Naqib has been appointed to the board of the ARAB INSURANCE GROUP. He has long experience of the insurance market as general manager of the Kuwait Reinsurance Company, based in Kuwait.

● Mr Clifford M. Kirtland Jr, chairman and chief executive officer of COX COMMUNICATIONS INC, will step down on June 1. He will continue as a director until the year-end. Company president Mr William A. Schwartz will succeed Mr Kirtland as chief executive officer. No other management changes are planned.

● Mr Peter J. Wright has been appointed a vice-president at MIDLAND BANK CANADA, with responsibility for the Vancouver branch and the British Columbia region.

● Mr John McInerney has joined EUROPEAN AMERICAN BANK, New York, as vice-president in the partnership lending unit of the merchant banking group. Partnership lending makes secured loans to tax-oriented investment partnerships. He will be responsible for partnership lending to the oil and gas, and equipment leasing industries. Mr John K. Kaderabek will join the bank as senior vice-president in charge of the automation services division. He was most recently executive vice-president of operations and data processing at New Jersey National Bank.

● Mr Chandler Ide will resign as chairman of the board of NATOMAS COMPANY following the annual meeting on May 3. He will remain a director. Mr Dorman L. Commons will be elected as board chairman, in addition to continuing as chief executive officer. He has been president and chief executive officer of Natomas for the past nine years.

FT INTERNATIONAL BOND SERVICE

U.S. DOLLAR STRAIGHTS	Issued	Bid	Offer	Change on day	Change on week	Yield
Amex O/S Fin. 10¾ 90	100	95⅝	96⅛	0	+0¼	11.13
Amro Bank 13 89	200	105¾	106¼	+0⅛	+0⅛	11.60
British Col. Hyd. 10¼ 88	200	98⅛	98⅝	0	+0⅝	10.68
British Col. Hyd. 15¾ 92	150	117⅛	117⅝	0	+0⅛	11.99
Canada 14⅜ 87	750	111⅛	111⅝	0	+0⅛	10.82
Canadair 12½ 89	175	105⅝	106⅛	+0⅛	+0⅛	11.21
Canadian Wheat 11¼ 90	50	100⅝	101⅛	+0⅛	+0⅛	11.06
Can. Pac. Sec. 15 89	75	110	110½	+0⅛	+0⅛	12.52
Citicorp O/S 15 84/92	100	104½	105	0	+0⅛	9.87
Coca Cola Int. 9⅞ 92	100	24⅞	25⅜	−0⅛	+0⅛	10.71
Coca Cola Int. 11¼ 89	100	104⅝	105⅛	−0⅛	+0⅛	10.61
Cr. Suisse BHA 10½ 90	150	100⅛	100⅝	+0⅛	+0⅛	10.41
Credit Suisse 10½ 89	100	100⅞	101⅜	−0⅛	+0⅛	10.24
Deutsche Bk. F. 14¼ 89	300	110⅝	111⅛	0	+0⅛	11.69
Du Pont 11¼ 95	150	102	102½	−0⅛	+0⅛	10.89
Du Pont 14⅛ 88 WW	200	108⅛	108⅝	0	+0⅛	12.09
EDC 10¾ 88	100	100⅛	100⅝	0	+0⅛	10.68
EDF 12⅞ 87	150	103⅛	103⅝	−0⅛	+0⅛	11.70
EEC 11½ 95	200	99⅜	99⅞	−0⅛	+0⅛	11.56
EIB 11 91	125	98⅝	99⅛	0	+0⅛	11.19
EIB 15½ 92	100	113½	114	0	+0⅛	12.84
Exp. Dev. Cpn. 11¼ 87	100	102⅝	103⅛	0	+0⅛	10.87
Forsmarks 13¾ 92	75	106⅛	106⅝	+0⅛	+0⅛	12.53
Gaz de France 12¼ 93	175	20⅞	21	0	+0⅛	12.11
Gen. Elec. Credit 9⅝ 91	100	15	15½	+0⅛	+0½	10.62
Gen. Elec. Credit. 12 88	100	107	107½	0	0	10.38
GMAC O/S Fin. 10⅝ 90	200	98⅛	98⅝	0	+0⅛	10.80
GMAC O/S Fin. 15 87	100	109	109½	0	+0⅛	11.99
Gulf Oil Fin. 12⅝ 87	100	103⅞	104⅜	0	+0⅛	10.99
Honeywell Int. 10¾ 90	100	97⅞	98⅜	0	+0⅛	11.18
IBM Wld. Trade 12¾ 92	200	109⅞	110⅜	0	+0⅛	10.49
Manitoba Prov. 11⅛ 89	125	102⅞	103⅜	−0⅛	+0⅛	11.03
Manitoba Prov. 13¾ 89	100	108⅞	109⅜	−0⅛	0	11.65
Midland Int. F. 11½ 92	150	100⅛	100⅝	0	+0½	11.39
Nat. West. Fin. 11¾ 92	150	102	102½	0	+0⅛	11.38
New Brunswick 15¾ 87	75	111⅛	111⅝	−0⅛	+0⅛	11.62
Newfoundland 15½ 90	75	113⅜	113⅞	−0⅛	+0⅛	12.52
Nippon Credit 11¾ 93	100	98⅛	98⅝	0	+0⅛	11.62
Nova Scotia Pr. 15⅝ 89	75	113⅛	113⅝	−0⅛	+0⅛	12.08
Ontario Hydro 11⅝ 89	200	102½	103	0	+0⅛	10.68
Ontario Hydro 12⅝ 92	200	107	107½	0	+0⅛	11.43
Ontario Hydro 15 92	150	117⅛	117⅝	0	+0⅛	11.78
Prudential O/S 10½ 93	100	99⅞	100⅜	0	+0⅛	10.60
Prudential O/S 12¾ 87	150	107	107½	0	+0⅛	10.60
Quebec Hy. 11½ 92 (0)	100	101⅝	102⅛	0	+0⅛	11.13
R. J. Reynolds 12¾ 89	100	105⅛	105⅝	0	+0⅛	11.49
Saskatchwn. Pr. 10¾ 90	125	98⅞	99⅜	+0⅛	+0⅛	10.98
Skand. Enskil. 11½ 88	100	98⅞	99⅜	0	+0⅛	11.59
SNCF 11½ 93	100	99⅜	99⅞	0	+0⅛	11.56
Swed. Exp. Cr. 14⅝ 90	100	110⅛	110⅝	−0⅛	+0⅛	12.45
Swiss Bk. Cpn. 10⅛ 90	125	100⅝	101⅛	0	+0⅛	10.02
Texaco Capital 9⅝ 90	150	94⅞	95⅜	0	+0⅛	10.61
UBS 11 89	150	103⅛	103⅝	0	+0⅛	10.24
Walt Disney Pr. 12½ 89	75	105⅞	106⅜	0	+0⅛	11.29
World Bank 10¼ 88	150	98⅞	99⅜	0	−0⅛	10.68
World Bank 10⅞ 93	100	98⅞	99⅜	0	+0⅛	11.01
World Bank 11½ 98	100	98⅞	99⅜	0	+0⅛	11.31

Average price changes... On day 0 on week +0⅛

DEUTSCHE MARK STRAIGHTS	Issued	Bid	Offer	Change on day	Change on week	Yield
Aeroport Paris 8⅝ 92	80	100⅝	101⅛	−0⅛	+0⅛	8.09
Australia 8⅞ 93	200	99	99½	+0⅛	+0⅛	8.98
Australia 7¾ 92	200	104⅝	105⅛	0	+0⅛	7.02
Bank of Tokyo 7⅝ 90	100	99⅞	100⅜	−0⅛	−0⅛	7.22
Bayer Capital 7⅝ 89	150	104⅝	105⅛	+0⅛	+0⅛	6.68
Caisse N. Energie 6 93	100	100⅛	100⅝	0	−0⅛	7.82
Caisse Nat. Tele. 7⅝ 93	200	98⅛	98⅝	0	0	7.87
ECSC 7½ 93	150	99⅜	99⅞	+0⅛	+0⅛	7.59
EEC 7¾ 95	200	100	100½	0	0	7.71
EEC 8 94	200	101⅜	101⅞	0	+0⅛	7.77
Eurofima 7½ 91	100	101⅞	102⅜	0	+0⅛	7.13
Ferrovie Dello 8⅝ 88	150	102⅛	102⅝	+0⅛	+0⅛	8.10
Gould Int. Fin. 8⅝ 89	75	103⅝	104⅛	0	+0⅛	7.48
H. J. Heinz Int. 6⅝ 88	50	100	100½	0	+0⅛	6.48
Int.-Am. Dv. Bk. 8⅝ 93	150	101	101½	0	+0⅛	8.06
Ireland 8½ 90	150	101⅜	101⅞	0	+0⅛	8.18
Ireland 8⅞ 91	150	101⅞	102⅜	−0⅛	−0⅛	8.48
ITT Antilles 7 93	200	98	98½	0	−0⅛	7.25
McDonalds Fin. 7½ 92	100	101⅜	101⅞	0	0	6.88
Mitsui OSK 7⅝ 88	100	100	100½	0	+0⅛	7.18
Mount Isa Fin. 7⅝ 90	100	98⅝	99⅛	+0⅛	+0⅛	7.94
Quebec Hydro 8 93	200	102⅝	103⅛	0	+0⅛	7.52
Sweden Kingdom 8⅛ 88	150	102⅛	102⅝	0	−0⅛	7.74
Volkswagen Int. 7⅛ 93	200	98⅛	98⅝	0	+0⅛	7.48
World Bank 7⅛ 93	200	98⅝	99⅛	+0⅛	+0⅛	7.45

Average price changes... On day 0 on week +0⅛

SWISS FRANC STRAIGHTS	Issued	Bid	Offer	Change on day	Change on week	Yield
Air Canada 5½ 95	100	98½	99	0	+0⅛	5.26
American Expre. 4⅞ 93	100	98⅛	98½	−0⅛	+0⅛	4.96
Asian D. B. 5⅞ 95	100	98⅝	99	−0⅛	−0⅛	6.01
ATR Finance 5⅝ 93	75	97⅝	98	−0⅛	0	5.91
Carls-Tuborg O. 5⅝ 93	100	101⅜	102	−0⅛	0	5.50
Chugoku E. Pow. 6⅝ 91	100	103	103⅝	+0⅛	+1⅛	5.61
Chujitsuya Co. 5⅞ 93	50	97⅝	98	0	+0⅛	6.17
Ex.-Im. Bk. Japan 6 93	100	97	97⅜	0	+0⅛	6.38
First Interstate 6 92	100	104	104⅜	+0⅛	+0⅛	5.44
Gaz de France 6 93	100	100⅝	101	0	0	5.88
Gothenb'g Airport 6 93	50	100	100⅜	0	0	5.98
HCA Finance 5 93	100	97	97⅜	−0⅛	0	5.38
Kyushu Elec. Pwr. 6 92	100	101	101⅜	+0⅛	+1	5.84
Manitoba Prov. 5¾ 93	100	100⅝	101⅛	−0⅛	−0⅛	5.12
Nippon Express 6 93	50	101⅛	101½	+0⅛	0	5.81
Nippon Kokan 5⅝ 93	100	96	96⅜	0	+0⅛	6.10
Norsk Hydro 6½ 95	100	96	96⅜	−0⅛	0	5.89
OKO 6⅝ 93	60	101	101½	−1	−0⅛	6.58
Quebec 5⅞ 92	100	102½	102⅞	−0⅛	−0⅛	5.39
Shikoku El. Pow. 5⅝ 93	100	97½	97⅞	−0⅛	0	5.95
Tohoku El. Power 6 93	100	99⅛	99⅝	+0⅛	+0⅛	6.05
Transcanada Pipe 5⅝ 93	100	97⅝	98	−0⅛	−0⅛	5.90
Trizec Corpn. 6⅝ 91	100	100⅝	100⅞	−0⅛	+0⅛	6.19
Un. Bk. Norway 5⅝ 93	60	97½	97⅞	0	0	5.65
Volvo 5⅝ 91	60	101⅝	102	0	+0⅛	5.08
World Bank 5½ 93	100	100⅛	100½	+0⅛	0	5.41

Average price changes... On day −0⅛ on week +0⅛

YEN STRAIGHTS	Issued	Bid	Offer	Change on day	Change on week	Yield
Australia 8⅝ 92	15	105⅛	106	−0⅛	0	7.76
EIB 8⅛ 92	15	102⅛	103⅛	−0⅛	+0⅛	7.81
Japan Airlines 7⅝ 87	9	†100⅛	101⅛	−0⅛	+0⅛	7.52
New Zealand 7⅝ 89	15	99⅝	100⅛	0	+0⅛	7.69
World Bank 8⅛ 92	20	103⅛	104⅛	0	+0⅛	7.77

Average price changes... On day −0⅛ on week +0⅛

OTHER STRAIGHTS	Issued	Bid	Offer	Change on day	Change on week	Yield
CEPME 12½ 90 C$	50	†97	97½	0	+0⅛	13.11
Farm Credit 12⅛ 93 C$	50	†100	100½	+0⅛	+0⅛	12.08
Gaz de France 15 89 C$	75	†107	107½	+0½	+0⅛	13.23
Gaz Metro 14½ 92 C$	40	†103	104	0	0	13.78
Pancanadian 12½ 93 C$	50	†98½	99	+0⅛	+0⅛	12.73
Quebec Hyd. 14 92 C$	60	†108⅛	108⅝	0	+0⅛	12.78
Swed. E. Cr. 12⅝ 88 C$	50	†101⅝	102⅛	0	+0⅛	11.88
EIB 11¾ 91 ECU	80	99⅝	100⅛	−0⅛	−0⅛	11.77
Elf Norge 11⅞ 88 ECU	30	97⅛	98⅛	0	+0⅛	12.37
Amfas 8½ 87 Fl	60	102⅛	103⅛	−0⅛	+0⅛	8.14
Austria 7½ 88 Fl	100	100⅛	100⅝	−0⅛	0	7.37
Nederland Gas 7½ 88 Fl	100	100½	101	−0⅛	−0⅛	7.31
Neder. Midbk. 9⅝ 87 Fl	100	104⅛	104⅝	−0⅛	−0⅛	8.04
Quebec Prov. 7½ 88 Fl	100	99⅛	99⅝	−0⅛	0	7.71
World Bank 7 88 Fl	150	98⅝	99⅛	−0⅛	−0⅛	7.37
OKB 14 86 FFr	400	99	100	0	+0⅛	14.17
Solvay et C. 14⅝ 86 FFr	200	100⅛	101⅛	0	0	14.38
BFCE 14½ 87 £	30	107½	108½	+0⅛	+0½	11.93
CECA 13½ 88 £	20	105⅞	106⅜	−0⅛	+0⅛	11.97
CNT 12½ 89 £	20	100⅞	101⅜	0	+0⅛	12.26
EEC 11¾ 91 £	50	98⅝	99⅛	0	+0⅛	12.03
Fin. For Ind. 12⅛ 88 £	30	103⅝	104⅛	+0⅛	+0⅛	11.29
F. Mat. Granj. 12⅝ 92 £	30	24⅞	25⅜	+0⅛	+1	12.57
Gen. Elec. Co. 12½ 89 £	50	105⅜	106⅛	+0⅛	+1⅛	10.98
Hiram Walker 14⅛ 86 £	25	106⅞	107½	0	+0⅛	11.38
Mort. Bk. Fin. 11⅛ 89 £	15	24½	25½	+0⅛	+1	13.00
Norsk Hydro 12 90 £	30	98	99⅛	+0⅛	+1⅛	12.34
Norsk Hydro 14½ 87 £	30	107⅝	108⅛	0	+0⅛	11.86
Quebec 14½ 89 £	30	106⅞	107⅜	+0⅛	+1⅛	12.69
SCR France 15½ 92 £	30	106½	107½	+0⅛	+0⅛	14.08
SNCF 11½ 89 £	30	95⅝	96⅛	0	+0⅛	12.46
Tenneco Int. 14⅜ 87 £	30	†107⅛	108⅛	0	+0⅛	12.31
World Bank 11⅞ 91 £	75	26⅞	27⅜	0	+0⅛	12.04
Euratom 11 93 LuxFr	600	102⅝	103⅝	0	0	10.55
Europarat 12⅛ 92 LuxFr	500	104⅝	105⅝	0	+0⅛	11.63

FLOATING RATE NOTES	Spread	Bid	Offer	C.dte	C.cpn	C.yld
Bk. of Tokyo 0⅛ 91 (D)	0⅛	100⅛	100⅝	10/6	9⅝	9.71
BFCE 5⅛ 88	0½	98⅞	99⅜	20/7	9⅛	9.33
BFCE 5⅛ 87	0⅛	99⅝	100⅛	27/7	9.94	9.94
Caisse Nat. Tele. 5⅛ 90	0⅛	99⅝	100⅛	21/4	10.56	10.60
CCF 5⅛ 95	0⅛	99⅝	100	7/4	5⅛	5.26
CCF 5⅛ 98	0⅛	99⅞	100⅜	24/9	5⅛	5.24
CEPME 5⅛ 92	0½	99⅞	100⅜	10/6	9.94	9.93
Chemical NY 5⅛ 94	†0⅛	100⅛	100⅝	28/6	9⅞	9.81
Credit Agricole 5⅛ 87	0⅛	99⅝	100⅛	24/9	10	10.01
Credit du Nord 5⅛ 92	0⅛	99⅝	100⅛	23/6	10⅛	10.14
Credit Lyonnais 5⅛ 97	0⅛	99⅝	100⅛	1/10	10.06	10.08
Credit Lyonnais 5⅛ 94	0⅛	99⅝	99⅞	5/7	9⅝	9.79
Credit Nat. 5⅛ 94	0⅛	99⅞	99⅞	9/9	9⅛	9.33
EDF 5⅛ 95 XW	0⅛	99⅝	99⅞	10/8	10	10.04
Kansallis Osake 5⅛ 92	0⅛	99⅞	100⅛	6/5	10.06	10.05
Lloyds Eurofin 5⅛ 93	§0⅛	100⅛	101	29/4	10.56	10.48
Long Term Cred. 0⅛ 92	‡0⅛	100½	100⅞	27/5	10⅛	10.10
J. P. Morgan 5⅛ 97	§0⅛	100½	101	12/5	9⅛	9.43
New Zealand 5⅛ 87	0⅛	100⅛	100⅝	7/10	10.06	10.01
NZ Steel Dev. 5⅛ 92	0⅛	100⅛	100⅝	22/6	10.19	10.14
Nippon Credit 5⅛ 90	0⅛	100⅛	100⅝	10/8	9⅞	9.81
Scotland Int. 5⅛ 92	0⅛	100⅛	100⅝	23/9	9.94	9.90
Sec. Pacific 0⅛ 91	0⅛	100⅛	100⅝	24/5	10.06	10.00
Societe Generale 5⅛ 95	0⅛	99⅛	99⅝	1/9	9⅛	9.55
Standard Chartd. 0⅛ 91	0⅛	100½	101	18/5	10.69	10.61
Sweden 5⅛ 93	0⅛	99⅝	99⅞	3/8	10.19	10.23
Sweden 0⅛ 89	0⅛	99⅝	99⅞	26/8	9⅛	9.66

Average price changes... On day 0 on week +0⅛

CONVERTIBLE BONDS	Cnv. date	Cnv. price	Bid	Offer	Chg. day	Prem
Ajinomoto 5⅛ 96	7/81	933	96	97½	−1⅛	19.27
Bridgestone Tire 5½ 96	3/82	470	101⅞	102⅝	−3	−1.98
Canon 7 97	7/82	748.2	178⅛	179⅝	−3⅛	4.31
Fujitsu Fanuc 4½ 96	10/81	6614	105⅛	107⅛	0	36.38
Hitachi Cable 5⅛ 96	2/82	515	94½	96	−1	0.02
Hitachi Cred. Cpn. 5 96	7/81	1612	91⅝	92⅛	+0⅛	12.03
Honda Motor 5½ 97	3/82	759.6	111	112½	−2⅛	3.71
Kawasaki 5⅛ 96	9/81	229	85½	87	−0⅛	31.95
Kumagai Gumi 6½ 97	10/82	400	113⅞	115⅛	−0⅛	0.67
Kyowa Hakko 6⅛ 97	2/83	762	103⅛	104⅝	−1⅛	15.95
Marui 5 96	7/81	789.5	123	124½	−2⅛	3.59
Minolta Camera 5 96	10/81	826.4	74½	76	−1⅛	37.57
Murata 5⅛ 96	7/81	1971	104⅛	105⅝	+0⅛	22.95
Nippon Electric 5⅛ 97	2/82	765.8	121⅛	122⅝	−2⅛	6.45
Nippon Oil Co. 5½ 96	4/83	964	96	97⅛	−1½	2.67
Nissan Motor 5⅛ 98	4/83	770	94⅞	96⅛	−1⅛	0.25
Olympus Optic. 6⅛ 97	12/82	1331	101	102⅛	−1½	12.85
Orient Finance 5⅛ 97	3/82	1205	102⅞	104⅛	−2⅛	34.98
Sumitomo Elec. 5½ 97	3/82	577.3	94½	96	−2⅛	6.95
Sumitomo Met. 0⅛ 96	10/81	296.1	73⅛	75⅛	−0⅛	46.79
Fujitsu 3½ 93 SwFr	3/83	968	107½	108⅛	−0⅛	14.50
Sharp Cpn. 3½ 93 SwFr	3/83	1150	110	112	0	3.11
Konishiroku 6⅛ 88 DM	6/82	619	111	112	0	10.43
Mitsubishi H. 6 89 DM	2/82	263	107⅛	108⅛	−0⅛	25.88
Sam Realty 6⅛ 92 DM	2/83	385	112½	113⅛	−0⅛	0.46

EUROBOND TURNOVER

(nominal value in $m)

	Cedel	Euro-clear
U.S. $ bonds		
Last week	4,170.0	7,401.2
Previous week	6,126.6	9,797.2
Other bonds		
Last week	1,397.4	560.3
Previous week	1,351.2	929.5

* No information available—previous day's price.

† Only one market maker supplied a price.

STRAIGHT BONDS: The yield is the yield to redemption of the mid-price; the amount issued is in millions of currency units except for Yen bonds where it is in billions. Change on week = Change over price a week earlier.

FLOATING RATE NOTES: Denominated in dollars unless otherwise indicated. Coupon shown is minimum. C.dte = Date next coupon becomes effective. Spread = Margin above six-month offered rate (‡ three-month; § above mean rate) for U.S. dollars. C.cpn = The current coupon. C.yld = The current yield.

CONVERTIBLE BONDS: Denominated in dollars unless otherwise indicated. Chg. day = Change on day. Cnv. date = First date for conversion into shares. Cnv. price = Nominal amount of bond per share expressed in currency of share at conversion rate fixed at issue. Prem = Percentage premium of the current effective price of acquiring shares via the bond over the most recent price of the shares.

The list shows the 200 latest international bonds for which an adequate secondary market exists. The prices over the past week were supplied by: Kredietbank NV; Credit Commercial de France; Credit Lyonnais; Commerzbank AG; Deutsche Bank AG; Westdeutsche Landesbank Girozentrale; Banque Generale du Luxembourg SA; Banque Internationale Luxembourg; Kredietbank Luxembourg; Algemene Bank Nederland NV; Pierson, Heldring and Pierson; Credit Suisse/Swiss Credit Bank; Union Bank of Switzerland; Akroyd and Smithers; Bank of Tokyo International; Chase Manhattan; Citicorp International Bank; Credit Commercial de France (Securities) London; Daiwa Europe NV; Deltec Securities (UK); EBC; First Chicago; Goldman Sachs International Corporation; Hambros Bank; IBJ International; Kidder Peabody International; Merrill Lynch; Morgan Stanley International; Nomura International; Orion Royal Bank; Robert Fleming and Co.; Samuel Montagu and Co.; Scandinavian Bank; Societe Generale Strauss Turnbull; Sumitomo Finance International; S. G. Warburg and Co.; Wood Gundy.

Closing prices on April 8.

UK COMPANY NEWS

Laird advances to £19.1m at year end: lifts payout

SECOND HALF taxable profits of Laird Group advanced from £8.82m to £9.79m, leaving this transport systems and engineering concern £2.62m ahead at £19.1m in 1982. The year's turnover rose from £272.2m to £305.34m.

The final dividend is being raised from 2p to 2.1p net per 25p share making a higher total of 4.2p (4p). Earnings per share are given as 16.7p (18.5p).

Tax took £3.98m (£3.96m) including £2.5m (£2.3m) for overseas, and after extraordinary debits of £290,000 (£782,000) the attributable profits came to £12.84m (£11.73m). Dividends absorb £3.3m (£2.83m) leaving retained profits of £9.54m (£8.91m).

Current cost adjustments reduced the after tax profits to £10.6m and earnings per share to 13.5p.

An overvaluation by a subsidiary of stocks and work in progress in 1981 and earlier years has been corrected by reducing the group profits for 1981 by £367,000 and by writing off £855,000 against revenue reserves for earlier years.

● **comment**

With its shipbuilding interests nationalised and its steel-making division liquidated three years ago, the Laird Group has weathered the recession well in the UK. But the long-term contracts in Hong Kong of the Metro-Cammell train engineering company will be completed by 1985 and as there are no further major contracts in the offing to take up the slack, profits are likely to be dented by next year. But a recent order from British Rail to produce prototypes to replace its 3,000 aging suburban diesel multiple units, has given Laird hopes of luring away some of the future production work from BR Engineering in the post-Serpell age. Better short-term prospects are offered by the production of long-distance conveyors, which soaked up a major injection of capital last year, and European-style long-distance coaches. Laird's expansion into the U.S. has so far proved a disappointment with the recession last year reducing the sales of the cutting-tool industry by 30 per cent. Laird's sales fell by only 20 per cent and since November it has experienced a small upturn in demand. The motor components division has been the greatest success, boosting its operating profits from £2.5m to £3.5m in 1982 due to increased sales to BL and Renault and increased capacity in Germany. The balance sheet remains in good shape with £2m net cash, primarily because of the group's success in holding down its working capital to only £36m, or 12 per cent of sales, remarkably low for an engineering company. This success is also reflected in the high current cost pre-tax profits of £16.6m. On Friday's share price of 116p, the historic yield is 5.2 per cent.

SHARE STAKES

Cadbury Schweppes — Sir Adrian Cadbury has reduced his non-beneficial holding by the transfer of 82,700 ordinary shares to a beneficiary under a trust.

British Vita — L. D. Lawton, a director, has sold 10,000 ordinary shares. N. M. Grimshaw, a director, has sold 50,000 and G. Blunt, a director, has sold 7,500.

Grovebell Group — Sonesta Investment Co. has acquired 200,000 ordinary shares, increasing holding to £15.9m (50.86 per cent).

Murray Glendevon—Courtaulds Pensions Common Investment Fund now holds 1.88m ordinary (18 per cent) in the name of the nominee company, Courtaulds CIF Nominees.

Agreed £6m purchase of Lesme by Avana

Avana Group, which makes a wide range of food products, yesterday announced an agreed bid for Lesme, a privately-owned bulk chocolate maker, worth £6m.

The opportunity to bid for the company arose because Gill and Duffus, which has held a 33 per cent stake in Lesme since 1970, wanted to sell its holding.

Avana, which until now has had no involvement in the chocolate making business, will finance the purchase by issuing Avana shares worth £6m.

Lesme is in the process of moving to a new factory in Banbury, and so at present manufactures from two sites. When the new factory is completed, around the end of the year, the original London factory, founded in 1921, will be closed.

In the year to September 30 1982, Lesme earned pre-tax profits of £955,000 on a turnover of £14.5m. Its net assets at that time were £4.84m.

Mr Tom Barrett, Avana's finance director, said yesterday that a major attraction was the fact that Lesme was about to move into a new factory. In addition, he noted that Lesme was beginning to move into retailing—mainly selling chocolate chips and filled chocolate eggs—and could benefit from Avana's strength in the retail and marketing areas.

When Gill and Duffus decided it wanted to pull out, one of the other one-third shareholders, joint managing director Mr Derek Anderson, chose to follow its lead. This meant that Mr David Attwell, the company's other joint managing directors was faced with a choice of buying the other two out, or agreeing with them to find a buyer for the company.

Mr Attwell said yesterday that he had eventually decided to sell, in part because of the great cost of buying the 66 per cent he did not own. He will nevertheless remain as sole managing director, and will be joined on the board by Dr John Randall, Avana's chairman, and Mr Barrett. Mr Attwell said he had great faith in Avana, and was happy to give them his full support.

Mr Anderson will remain a consultant to Lesme, but will take up a new post with a commodity broking firm in London.

Smurfit expands further in U.S.

BY DAVID DODWELL

Jefferson Smurfit, the Dublin paper and packaging products manufacturer, has bought the 50 per cent of Smurfit Diamond Packaging Corporation that it did not already own for $8.5m (£5.67m).

Jefferson bought its original 50 per cent stake in the company from Diamond International in July last year in a deal worth £84m. The other 50 per cent was taken up by Clarke Enterprises of Chicago, though Jefferson had a 10-year option to buy the remaining 50 per cent.

Mr Howard Kilroy, Jefferson's chief operations director, said Jefferson had agreed to pay Clarke in cash from current funds: "We have moved fairly quickly to take up our option because we like what we see," he said.

In the original deal, the two partners paid $7.5m apiece, and raised a $70m long-term loan in the U.S., to buy from Diamond its packaging, container, paper board, and graphic arts divisions.

Smurfit Diamond, together with other Smurfit operations in the U.S., has sales of more than $725m a year, the company said at the weekend. Combined operations employ 6,800 people in 70 plants.

Smurfit Diamond itself is based in Cincinatti. In 1981 as part of Diamond it made profits of $8.5m before tax, on sales of $190m. More recent figures will be revealed when Jefferson Smurfit announces annual profits and turnover figures at the end of the month.

BOARD MEETINGS

The following companies have notified dates of board meetings to the Stock Exchange. Such meetings are usually held for the purpose of considering dividends. Official indications are not available as to whether the dividends are interims or finals and the sub-divisions shown below are based mainly on last year's timetable.

TODAY

Interims: Bryant, Glaxo, James Halstead, Highland Distilleries, Pineapple Dance Studios, TSW—Television South West, W. A. Tyzack.

Finals: Anchor Chemical, Barton Group, Edinburgh Securities, Jersey Electricity, Queens Moat Houses, Rugby Portland Cement.

FUTURE DATES

Interims:

British Empire Secs Gen Tst	Apr 18
Japan Assets Trust	Apr 18
Ulster Television	Apr 16

Finals:

British Home Stores	May 2
Brown Boveri Kent	Apr 14
Fogarty	Apr 20
General Scottish Trust	Apr 21
Hawker Siddeley	Apr 20
Hicking Pentecost	May 27
Hoskins and Horton	Apr 25
House Property of London	Apr 14
Hunting Petroleum Services	Apr 15
Lawrence (Walter)	Apr 13
Morgan Crucible	Apr 14
Pursuit	Apr 14
Spencer (George)	Apr 13
Sun Life Assurance	Apr 20
United Ceramic Distributors	†Apr 14
Websters Group	Apr 18

† Corrected.

Milford chief gets new shares prior to rights

A PRESSING need for funds has prompted the troubled Milford Docks Company to come up with an unusual scheme for the introduction of new capital.

In terms of an agreement with its chairman, Mr Jack Bennatt, the company plans to issue to him some 338,000 new ordinary shares at 10p per unit, compared with the £1 nominal value of the shares. In return, the contract requires Mr Bennett to find underwriters for a rights issue which is intended to raise a further £500,000.

Milford revealed yesterday that its bankers had refused to advance further funds because of continuing heavy losses. The shares fell 15p to 80p on the stock market, after the announcement of the company's proposals.

The first leg of the deal would give Mr Bennett roughly 30 per cent of Milford's shares at a discount of 87.5 per cent to the current market price. The plan to raise a further £500,000 would dilute that holding significantly and would involve the issue of 5m new shares at the offer price of 10p. Depending on whether shareholders approve the scheme, Mr Bennett may have the right to place a further £182,000 in ordinary shares at 10p per share. Mr Charles Smith, president, says the deal has been approved by the stock exchange.

Cope Allman reiterates rejection of Dowable

THE BOARD of Cope Allman, fighting off a 60p a share bid from the Dowable consortium, said on Friday that it was "very gratified" at the failure of the consortium to acquire more than 21.5 per cent of the Company's shares by the first closing date for the bid on Wednesday.

In response to the Dowable decision to extend the offer, which values Cope Allman at £23.75m, for a further two weeks, Mr Michael Doherty, the company's chief executive, said: "It remains the view of the board that the offer is totally inadequate and unacceptable." He strongly advised shareholders to reject "this opportunistic bid."

Cope Allman, which has interests ranging from leisure, to packaging and engineering, emphasised that the offer had attracted sales from shareholders accounting for just 1.8 per cent of Cope's shares. Dowable had held 19.7 per cent before the formal bid was mounted.

RECENT ISSUES

EQUITIES

Issue price	Amount paid up	Latest Renunc. date	1982/3 High	1982/3 Low	Stock	Closing price	+ or −	Net Div.	Times Covered	Gross Yield	P.E. Ratio
140	F.P.	15/4	145	132	★Airship Inds.	133	.....	—	—	—	—
112	F.P.	16/3	164	129	Assoc. British Ports	158	−1	b7.0	1.6	6.3	15.0
—	F.P.	—	100	96	Atlntc M'trp'n U.S.$.10	95	.....	Q8c	0.6	5.7	51.9
¶180	F.P.	—	253	228	Datastream Sp.	248	−5	b2.25	3.5	1.3	31.4
‖	F.P.	15/4	220	190	★Grainger Trust	190	.....	u5.5	8.5	3.8	17.8
438	F.P.	3/4	112	89	★HS Elect Comps 10p	95	.....	u1.18	3.2	1.7	21.3
‖ ‖	F.P.	—	50	44	★IntervisionVideo10p	45	+1	1.0	9.1	5.2	17.6
1648	F.P.	—	£67	£65	Perstorp AB Free 'B'	£66	.....	g9.84%	5.2	0.7	29.1
‖ ‖	F.P.	—	110	83	★Sinclair (Wm.)	83	.....	★4.25	1.0	7.3	29.1
‖ ‖	F.P.	—	105	77	Do. Defd.	80	.....	—	—	—	—
173	F.P.	25/3	305	265	Superdrug Stores 10p	265	−2	Hd5.5	9	1.9	9
§10	F.P.	11/5	29	22	★Tele.Services Int10p	24	−½	b0.2	3.3	1.2	35.7
472	F.P.	30/5	113	89	★Utd. Packaging 10p	104	+2	b2.3	3.2	3.4	11.1
§150	F.P.	18/3	340	257	★WightCollinsst-$1Op	257	−12	bd2.75	3.3	1.3	28.7
—	F.P.	3/3	25	18	Yorks&Lancs.W'rrnts.	18	.....	—	—	—	—

FIXED INTEREST STOCKS

Issue price £	Amount paid up	Latest Renunc date	1982/3 High	1982/3 Low	Stock	Closing price £	+ or −
99.431	£30	10/4	21⅞	12	Birmingham 11¼% Red. 90-12	19¼	.....
¶¶	F.P.	—	95½	95	Brooke Tool 17% Conv. Cum. Prf. 50p	95	−½
¶100	F.P.	9/6	100¼	100¼	E.Worcestershire Water 7% Rd. Prf.1986	100½	.....
** £3	F.P.	31/3	224p	162p	Electro-Protective 7% Cnv. Prf.	189p	+20
18	£25	30/6	95	24¼	Hambros Inv. 6-17% Stpd. Deb. 2018	83	.....
‖ ‖	F.P.	—	235p	158p	★Intervision 7% Cnv. Red. Prf.	155p	−5
—	—	—	100⅛	99	Nationwide Bdg. Soc. 11¼% Bds. 19/6/84	100¼	+⅛
—	—	—	100¼	100 1/16	Do. 11¼% Bds. 9/4/84	100¼	+1/16
**	F.P.	—	12p	11p	Newman Inds. 10% Cm Cnv Red.Prf.10p	12p	.....
§97.174	£25	6/5	31¼	28	Pearson (B) 13% Ins. Ln. 2007	31	+½
¶100	F.P.	9/6	102	101½	Sutton Dist. Water 7% Pref. 1988	101½	.....

"RIGHTS" OFFERS

Issue price	Amount paid up	Latest Renunc. date ●	Latest Renunc. date ■	1982/3 High	1982/3 Low	Stock	Closing price	+ or −
250	F.P.	28/2	28/4	342	273	AGB Research 10p	310	−2
73	F.P.	18/4	15/6	94	87	★Aldcom Int. 10p	87	.....
‡‡140	F.P.	25/3	15/4	134	73	★Airship Inds.	133	.....
280	F.P.	25/3	2d/4	410	285	Applied Computer	390	−5
55	Nil	—	—	31pm	42pm	BSR 10p	49pm	−2
11	F.P.	—	12/4	13¼	10½	★Berkeley&Hay Hill Invs 10p	10¾	.....
12	F.P.	—	—	14	11½	Bisemel Bros.	14	.....
155	F.P.	—	—	195	175	Brit. Car Auctions 10p	185	.....
173	Nil	—	—	58pm	50pm	Collins (William)	58pm	.....
178	Nil	—	—	55pm	46pm	Do. A	55pm	.....
43	Nil	—	—	7pm	6pm	Comben Grp. 10p	3pm	.....
73	F.P.	7/5	15/5	105	85	Cominion Int. 80p	91	.....
22	Nil	—	—	2pm	1½pm	East Rand Cons. 10p	1½pm	−½
95	Nil	—	—	16pm	10pm	Ferguson Ind.	15pm	.....
565	F.P.	—	—	565	532	Fisons £1	574	.....
108	F.P.	7/5	29/5	117	113	★Garfunkels 10p	114	.....
165	F.P.	11/5	10/6	183	162	Beers Gross 10p	183	+4
30	Nil	—	—	13pm	1Opm	Guinness Peat	16pm	+1
152	Nil	—	—	16pm	6pm	Hampton Bld Mining 10p	12pm	−3
260	Nil	—	—	58pm	44pm	Harris Queensway	47pm	−2
I¶£0.80	Nil	—	—	20pm	18pm	Irish Distillers	13pm	.....
185	Nil	—	—	77pm	30pm	LASMO	70pm	−7
140	F.P.	29/3	5/5	193	173	Magnet & Southerns	176	−1
25	F.P.	15/3	23/4	32	23	Mettoy	23	.....
37	F.P.	21/7	7/4	37	32	Mount Charlotte 10p	35½	+½
176	Nil	—	—	62pm	32pm	Mowlem (J.)	58pm	−4
A£1.58	P.P.	—	—	86	87	North B. Hill 50c	80	.....
58	F.P.	8/2	29/4	75½	61	Stakis 10p	75½	.....
400	F.P.	4/3	22/4	555	428	Ultramar	550	.....
91	F.P.	28/5	3/6	98	100	Valor	97	.....
15	Nil	—	—	10pm	8pm	Whittington Int'l	8pm	−1

Renunciation date usually last day for dealing free of stamp duty. b Figures based on prospectus estimates. d Dividend rate paid or payable on part of capital: cover based on dividend on full capital. e Assumed dividend and yield. ★ Forecast dividend: cover based on previous year's earnings. H Dividend and yield based on prospectus or other official estimates for 1983-84. Q Gross. ooly for restricted dividends. ● Figures or report awaited. § Placing price. p Pence unless otherwise indicated. ¶ Issued by tender. ‖ Offered to holders of ordinary shares as a "rights." ** Issued by way of capitalisation. §§ Re-introduced. ¶¶ Issued in connection with reorganisation merger or take-over. ‖‖ Introduction. □ Issued to former preference holders. ■ Allotment letters (or fully-paid). ● Provisional or partly-paid allotment letters. ★ With warrants. ‡ Effective issue price after scrip. † Formerly dealt in under special rule.

PENDING DIVIDENDS

	Date	Announcement last year
*Adwest	Apr 15	Interim 2.1
Akroyd and Smithers	May 10	Interim 4.0
*Assoc. Brit. Ports	Apr 14	Final 7.04
Assoc. Paper Industs	May 11	Interim 1.0
Aurora	Apr 7	Final nil
Aust. and NZ Banking	May 17	Interim 14c
Automotive Prods	Apr 8	Final 2.0
BOC	May 17	Interim 2.6
*Bank of Ireland	May 12	Final 14.0
*Bank of Scotland	Apr 18	Final 11
*Barrow Hepburn	Apr 14	Final 1.4
Bellway	May 12	Interim 3.0
*Blackwood Hodge	Apr 15	Final 0.75
Blue Circle	Apr 28	Final 11.75
*Bowthorpe	Apr 12	Final 1.884
*British Home Stores	May 8	Final 3.0
*Brixton Est.	Apr 20	Final 1.95
Brockhouse	May 20	Interim nil
*Brown Boveri Kent	Apr 14	Final nil
Brown (M.)	May 17	Interim 1.35
*Bryant	Apr 11	Interim 1.0
*Burmah Oil	Apr 13	Final 7
Coats Patons	May 12	Final 2.6
Common Bros	May 19	Interim 1.429
Costain	May 11	Final 6.5
Currys	Apr 19	Final 4.2
Debenhams	May 21	Final 4.324
*Dunlop	Apr 21	Final 2.0
*Empire Stores	Apr 13	Final 1.35
Euro Ferries	May 12	Final 2.1
*Expamet Intl	Apr 12	Final 2.6
Flight Refuelling	Apr 28	Final 2.35
French Kier	May 4	Final 3.15
Gerard Nat.	May 8	Final 10.75
*Gill & Duffus	Apr 13	Final 4.3
*Glaxo	Apr 11	Interim 4.5
Grand Metropolitan	May 14	Interim 3.5
*Hall (Matthew)	May 11	Final 4.03
*Hambro Life	Apr 19	Final 3.02
*Hawker Siddeley	Apr 20	Final 3.3
Heath (C. E.)	May 16	Final 3.5
*Highland Dist.	Apr 11	Interim 0.88

	Date	Announcement last year
*Kwik Save Disc.	Apr 22	Interim 1.8
Laing (J.)	Apr 27	Final 1.875
Land Secs.	May 17	Final 5.85
Laporte	Apr 22	Final 3.5
Lead Inds.	Apr 7	Final 5.96
*London Brick	Apr 14	Final 3.156
London and Northern	May 19	Final 1.39
Marks and Spencer	Apr 29	Final 2.85
*Menzies (J.)	Apr 28	Final 3.05
Minet	Apr 13	Final 2.89
*Morgan Crucible	Apr 14	Final 4
Nat. Sk. Aust.	May 13	Interim 11c
*NEI	Apr 12	Final 2.75
*Newarthill	Apr 14	Final 8.0
*Pearl Assoc.	Apr 13	Final 14.5
P & O	May 5	Final 7.0
Pleasurama	May 20	Interim 1.75
*Polly Peck	May 19	Interim due
*RMC	Apr 20	Final 5.8
*Reed (Ausz.)	Apr 14	Final 2.46
*RTZ	Apr 14	Final 10.5p
Royal Bank Scotland	May 9	Interim due
*Rugby Portland Cement	Apr 11	Final 2.65
Rush and Tompkins	Apr 22	Final 2.75
Sainsb'y (J.)	May 5	Final 8.5
Samuel Props	Apr 22	Interim 1.2
Sears	May 11	Final 1.8
Simon Eng.	Apr 26	Final 8.8
*Smiths Inds.	Apr 12	Interim 4.0
*Smith (W.H.)	Apr 20	Final 1.071
Smurfit (Jeff.)	May 12	Final 8.218
*Tarmac	Apr 26	Final 12.8
*Taylor Woodrow	Apr 14	Final 13.157
*Telephone Rentals	Apr 27	Final 5.15
Tozer Kemsley and Millbourn	Apr 17	Final 0.3
Trafalgar House	May 12	Interim 3.5
Travis and Arnold	Apr 26	Final 3.89
Vaux Brews.	May 18	Interim 2.75
Whessoe	May 11	Interim 2.0
Whitbread	May 17	Final 3.4
*Wimpey (George)	Apr 28	Final 1.65

* Board meeting intimated. † Rights issue since made. ‡ Tax free. § Scrip issue since made. ¶ Forecast.

LADBROKE INDEX
based on FT Index
872-677 (+2)
Tel.: 01-493 5261

Closing prices April 8

NEW YORK STOCK EXCHANGE COMPOSITE PRICES

12 Month High	12 Month Low	Stock	Div.	Yld.	P/E	Sls 100s	High	Low	Close Quote	Ch'ge Prev. Close
12⅞	5¼	AAR	.44	4.1	18	36	10⅞	10⅝	10¾	+⅛
33	27½	ACF	2.76	8.8	9	184	32¾	31⅝	32⅛	+⅛
26	12¾	AMF	1.36	8.1	32	137	17¼	16⅝	16¾	−⅛
28⅝	13¼	AMR Cp				4348	27⅞	27	27¼	−⅛
14⅞	4	AMR	wt			764	14	13½	13¾	−⅛
18¾	12⅞	AMR	pf2.18	12		74	17⅞	17⅝	17⅞	−⅛
32⅞	24⅞	AMR	pf2.13	6.9		88	32⅛	31½	32	−⅛
6⅞	2½	APL				16	5⅝	5½	5⅝	
47⅞	24⅝	ARA	2.06	4.4	14	678	47	46¾	46⅞	+⅞
73⅞	24½	ASA	3a	4.6		677	65¾	64¾	65¼	−⅛
26¾	13⅞	AVX	.32	1.3	33	559	25¼	25	25	+⅛
44⅞	27⅞	AbtLab	1	2.4	13	1771	43⅞	42⅝	42½	−⅛
29¾	26½	AccoW	n.12e	.4	20	147	27½	26⅞	27¼	+⅛
22½	15⅝	AcmeC	.40	1.9	23	37	20⅝	20¾	20⅝	−⅛
12⅞	5¼	AcmeE	.32b	2.8	29	23	11	10⅞	11	
17⅞	4⅛	AdmDg	.04	.3	14	278	16⅝	15⅝	15¾	−1⅛
17⅞	12½	AdaEx	1.73e	11		97	16	15⅝	15⅝	−⅛
9⅞	4⅞	AdmMl	.20e	2.1	12	29	9⅝	9½	9½	
23⅞	12⅞	Advest	a.16	.7	15	57	22⅞	22⅛	22⅝	+⅛
39¾	13	AMD	s		49	1248	32⅛	31½	32⅛	+⅞
49⅝	32⅞	AetnLf	2.64	6.9	9	2220	38⅝	38	38⅛	−½
37⅞	8	Ahmns	.60	1.7		1210	34⅞	33¾	34⅞	+⅞
3	2⅛	Aileen				31	3⅛	3	3⅛	+⅛
48⅛	23⅝	AirPrd	.60	2.1	11	2185	39⅛	38¾	39	+⅞
24¾	8⅝	AirbFrt	.60	3.0	26	14	19¾	19½	19¾	
3	2	AlMoa	n		4	87	2⅛	2⅛	2⅛	
31⅛	24⅝	AlaP	pfA3.92	13		2	31⅛	31⅛	31⅛	
7⅛	5⅝	AlaP	dpf.87	12		19	7⅛	7	7	
71⅛	55½	AlaP	pf 9	12		370	u72½	72	72⅛	+1
95½	73½	AlaP	pf 11	12		z100	93	93	93	
75⅞	57	AlaP	pf9.44	12		214	75⅞	75	75⅞	
66	50⅛	AlaP	pf8.16	12		z1500	65½	65½	65½	+2⅛
67½	51	AlaP	pf9.28	12		z2180	65½	64½	65½	−2
17½	13	Alagsco	1.60	9.6	5	5	17	16⅞	16⅞	−⅛
15½	4⅞	AlskAir	.12	.8	11	377	13⅝	13⅛	13⅝	+⅛
35⅞	23⅝	Albany	1.40	4.6	13	102	32⅞	31¾	32⅞	+1⅛
24⅛	10¼	Alberto	.54	3.5	19	41	16	15⅝	15⅝	−⅛
49½	26⅛	Albisn	1.20	2.5	13	75	48⅞	48¼	48⅞	+⅛
33	15⅝	Alcan	.90	3.0		419	30¾	30	30¾	+⅛
32⅛	16	AlcoStd	1.12	3.7	11	26	30¾	30⅛	30⅛	

Continued on Page 21

AMERICAN STOCK EXCHANGE COMPOSITE PRICES

Closing prices April 8

C—C—C

D—D—D

E—E—E

F—F—F

G—G—G

H—H—H

I—I—I

J—J—J

K—K—K

L—L—L

M—M—M

N—N—N

O—O—O

P—Q

R—R—R

Continued on Page 22

NEW YORK STOCK EXCHANGE COMPOSITE PRICES

Continued from Page 20

O—O—O

P—Q

R—R—R

S—S—S

T—T—T

U—U—U

V—V—V

W—W—W

Continued on Page 22

Sales figures are unofficial. Yearly highs and lows reflect the previous 52 weeks plus the current week, but not the latest trading day. Where a split or stock dividend amounting to 25 per cent or more has been paid, the year's high-low range and dividend are shown for the new stock only. Unless otherwise noted, rates of dividends are annual disbursements based on the latest declaration.

a–dividend also extra(s). b–annual rate of dividend plus stock dividend. c–liquidating dividend. cld–called. d–new yearly low. e–dividend declared or paid in preceding 12 months. g–dividend in Canadian funds, subject to 15% non-residence tax. i–dividend declared after split-up or stock dividend. j–dividend paid this year, omitted, deferred, or no action taken at latest dividend meeting. k–dividend declared or paid this year, an accumulative issue with dividends in arrears. n–new issue in the past 52 weeks. The high-low range begins with the start of trading. nd–next day delivery. P/E–price-earnings ratio. r–dividend declared or paid in preceding 12 months, plus stock dividend. s–stock split. Dividends begins with date of split. sls–sales. t–dividend paid in stock in preceding 12 months, estimated cash value on ex-dividend or ex-distribution date. u–new yearly high. v–trading halted. vi–in bankruptcy or receivership or being reorganised under the Bankruptcy Act, or securities assumed by such companies. wd–when distributed. wi–when issued. ww–with warrants. x–ex-dividend or ex-rights. xdis–ex-distribution. xw–without warrants. y–ex-dividend and sales in full. yld–yield. z–sales in full.

WORLD STOCK MARKETS

Indices

NEW YORK — DOW JONES

	April 8	April 7	April 6	April 5	April 4	Mar. 31	1982-83 High	1982-83 Low	Since Cmpil'tn High	Since Cmpil'tn Low
♦ Industr'ls	1124.71	1117.95	1115.49	1120.16	1127.81	1130.03	1145.90 (24/3/83)	776.92 (12/8)	1145.90 (24/3/83)	41.22 (2/7/32)
H'me Bnds	74.57	74.25	74.27	74.07	74.15	74.13	74.57 (8/4/83)	56.87 (12/2)	—	—
Transport	509.57	508.11	501.59	505.10	506.59	507.59	519.70 (24/3/83)	292.12 (12/8)	519.70 (24/3/83)	13.32 (8/7/32)
Utilities	124.81	124.35	124.40	124.58	123.05	124.54	129.84 (5/5/83)	105.22 (30/7)	163.32 (20/4/65)	10.5 (28/4/42)
TradingVol 000's	67,710	68,480	77,415	75,818	66,010	100,570	—	—	—	—

♦ Day's high 1125.87 (1125.36) low 1109.52 (1106.71)

	Mar. 31	Mar. 25	Mar. 18	Year ago (Approx)
Indust'l div. yield %	4.85	4.79	4.88	6.64

STANDARD AND POORS

	April 8	April 7	April 6	April 5	April 4	Mar. 31	1982-83 High	1982-83 Low	Since Cmpil'n High	Since Cmpil'n Low
Indust'ls	171.31	[illegible]	169.21	170.52	171.72	171.55	172.57 (7/3/83)	114.08 (12/8)	172.57 (7/3/83)	3.52 (30/6/32)
§Comp'site	152.85	151.15	151.04	151.59	153.02	152.96	153.67 (4/3/83)	102.42 (12/8)	153.67 (4/3/83)	4.40 (1/6/32)

	April 6	Mar. 30	Mar. 23	Year ago (approx)
‡Indust'l div. yield %	4.30	4.22	4.25	5.76
Indust'l P/E ratio	12.94	13.16	13.06	7.81
Long Gov. Bond yield	10.46	10.60	10.59	13.34

N.Y.S.E. ALL COMMON

April 8	April 7	April 6	April 5	1982-83 High	1982-83 Low
87.27	87.59	86.97	87.47	88.66 (7/3/83)	58.80 (12/8)

Rises and Falls	April 8	April 7	April 6
Issues Traded	1,870	1,884	1,887
Rises	870	782	518
Falls	565	663	1,008
Unchanged	435	439	565
New Highs	—	57	31
New Lows	—	5	5

MONTREAL

	April 8	April 7	April 6	April 5	1982-83 High	1982-83 Low
Industrials	368.44	365.58	361.11	365.35	368.26 (10/3/83)	249.88 (21/6)
Combined	359.77	357.58	356.50	356.39	360.64 (19/3/83)	237.27 (21/6)
TORONTO Composite	2159.50	2155.9	2151.1	2154.7	2178.5 (17/3/83)	1359.2 (7/7)

NEW YORK ACTIVE STOCKS

Friday	Stocks traded	Closing price	Change on day		Stocks traded	Closing price	Change on day
Gil. Strm. W.I.	1,136,800	20⅞	—	Diamond Sham	782,900	23	—
Exxon	945,700	31½	+ ½	General Mills	777,800	51⅛	+ ⅞
Atlantic Rich.	941,800	43⅛	+ 1⅞	St. Oil Calif.	777,100	38¾	+ 1½
IBM	894,200	103⅞	+ ⅜	Baldwin United	690,600	12¾	+ ⅜
Comw. Edison	814,100	26⅝	— ½	Mesa Petrol	659,900	12⅞	+ ¼

	Apr. 8	Apr. 7	Apr. 6	Apr. 5	1982-83 High	1982-83 Low
AUSTRALIA						
All Ord. (1/1/80)	528.7	527.5	523.7	513.7	536.5 (4/1/83)	445.2 (8/7)
Metals & Minls. (1/1/80)	488.4	487.7	487.8	475.3	502.2 (2/3/83)	298.6 (8/7)
AUSTRIA						
Credit Aktien (2/1/62)	52.79	52.71	52.85	52.89	55.88 (4/1/83)	47.35 (28/10)
BELGIUM						
Belgian SE (31/12/63)	115.29	117.87	117.45	117.43	118.29 (8/4/83)	88.42 (20/1/82)
DENMARK						
Copenhagen SE (3/1/83)	130.66	128.62	127.52	131.92	134.05 (29/3/83)	100.00 (3/1/83)
FRANCE						
CAC General (31/12/82)	118.80	118.8	118.3	118.7	118.9 (8/4/83)	98.1 (5/1/83)
Ind Tendance (31/12/82)	125.80	125.6	125.8	125.4	125.8 (7/4/83)	99.6 (5/1/83)
GERMANY						
FAZ-Aktien (31/12/58)	304.46	306.21	306.24	301.46	308.24 (6/4/83)	214.96 (17/8)
Commerzbank (Dec 1953)	918.40	922.5	925.5	903.5	925.5 (6/4/83)	660.2 (17/8)
HONG KONG						
Hang Seng Bank (31/7/64)	1034.17	1014.18	998.48	(c)	1445.82 (12/1/82)	676.30 (2/12)
ITALY						
Banca Comm Ital. (1972)	204.48	202.98	204.66	210.73	214.85 (21/3/83)	147.25 (22/7)
JAPAN**						
Dow Average (16/5/49)	8433.37	8442.45	8479.40	8420.34	8436.92 (4/4/83)	6848.78 (1/10)
Tokyo New SE (4/1/68)	609.35	618.67	615.65	618.59	617.69 (31/3/83)	511.52 (17/8)
NETHERLANDS						
ANP-CBS General (1970)	127.10	127.5	127.2	127.4	127.5 (7/4/83)	84.6 (6/1/82)
ANP CBS Indust (1970)	108.50	108.5	108.0	107.3	108.9 (28/3/83)	65.2 (4/1/82)
NORWAY						
Oslo SE (4/1/83)	157.75	154.32	152.11	154.16	157.75 (8/4/83)	98.01 (4/1/83)
SINGAPORE						
Straits Times (1966)	879.58	880.52	881.97	865.05	879.8 (1/4/83)	557.97 (18/8)
SOUTH AFRICA						
Gold (1958)	—	827.2	(c)	(c)	1099.5 (15/2/83)	336.5 (8/7)
Industrial (1958)	—	886.3	(c)	(c)	898.9 (21/3/83)	587.3 (18/6)
SPAIN						
Madrid SE (31/12/82)	116.0	115.58	114.84	113.36	118.0 (8/4/83)	98.52 (11/1/83)
SWEDEN						
Jacobson & P. (1/1/58)	1295.34	1290.29	1291.77	1280.72	1318.65 (18/3/83)	663.39 (28/4)
SWITZERLAND						
SwissBankCpn. (31/12/58)	313.5	314.1	313.7	314.5	318.5 (25/2/83)	273.0 (17/8)
WORLD						
Capital Intl. (1/1/70)	—	158.1	156.6	156.5	158.5 (7/4/83)	119.4 (13/8)

(**) Saturday April 2: Japan Dow 8479.59, TSE 615.21.

Base values of all indices are 100 except Australia All Ordinary and Metals—500, NYSE All Common—50; Standard and Poors—10; and Toronto—1,000: the last named based on 1975. † Excluding bonds. ‡ 400 industrials. § 400 industrials plus 40 Utilities, 40 Financials and 20 Transports. c Closed. u Unavailable.

AUSTRIA

1982/3 High	1982/3 Low	April 8	Price %
222	205	Creditanstalt Pfd.	215
252	163	Goesser	246
405	360	Interunfall	370
218	174	Laenderbank	212
368	255	Perlmooser	308
178	127	Steyr Daimler	156
214	156	Veitscher Mag	210

BELGIUM/LUXEMBOURG

1982/3 High	1982/3 Low	April 8	Price Frs.
1,700	990	ARBED	1,120
4,100	3,720	Bank Int A Lux	3,900
2,890	1,450	Bekaert B	2,590
1,950	1,250	Ciment BR	1,875
215	76	Cockerill	98
4,300	2,495	Delhaize	3,850
2,280	1,550	EBES	2,275
5,600	3,240	Electrobel	5,600
3,005	2,000	Fabrique Nat	2,800
2,990	2,180	G.B. Inno	2,890
1,910	1,200	GBL (Brux)	1,805
2,205	1,490	Gevaert	2,190
4,800	2,550	Hoboken	4,665
1,800	1,298	Intercom	1,800
5,870	3,990	Kredietbank	5,670
8,010	3,500	Pan Hldgs	7,900
5,100	4,290	Petrofina	5,090
5,630	4,300	Royale Belge	3,180
9,850	1,650	Soc. Gen. Banq	2,850
1,645	1,030	Soc. Gen. Belge	1,635
4,740	3,100	Sofina	4,740
2,685	1,820	Solvay	2,685
3,395	2,220	Traction Elect	3,370
3,195	1,400	UCB	3,070
4,360	1,315	Vieille Mont	4,320

DENMARK

1982/3 High	1982/3 Low	April 8	Price %
410	294	Aarhus Olie	359
295	113.2	Andelsbanken	265
477	251	Baltica Skand	477
264.6	125	CopHandelsbank	251.4
528	201	D. Sukkerfab	496.4
307.5	125.4	Danske Bank	278.2
145.2	74.0	East Asiatic	123.4
870	505	Forenede Brygg.	807
461	145	Forenede Damp.	195
344.2	142	GNT Hldg.	313
445	276.5	I.S.S.B.	480
520	170	Jydske Bank	472
9,295	1,400	Novo Ind.	2,080
279.5	117.5	Privatbanken	254
239.6	118	Provinsbanken	217.6
979	152.4	Smidth (FL)	212.4
805	465	Sophus Berend.	752.4
175	84	Superfos	155

CANADA

1982-83 High	1982-83 Low	Stock	Apr. 8
27⅛	15⅛	AMCA Intl.	25⅜
22¾	13¾	Abitibi	22
22¼	12¾	Agnico Eagle	17½
20¼	8	Alberta Energy	14¼
40⅛	20⅝	Alcan Alumin	37¼
43¾	22¾	Algoma Steel	30
19	9⅛	Asbestos	12½
30⅝	17⅛	Bk Montreal	30⅝
42	20	Bk Nova Scotia	42
4.60	1.05	Basic Resources	—
25⅞	18¾	Bell Canada	25⅛
18⅛	7¾	Bombardier	14⅞
20	10¼	Bow Valley	17⅜
—	—	BP Canada Res.	20½
29	12¼	Brascan A	27⅛
3	2.35	Brinco	3.05
12⅛	8¼	B.C. Forest	10
34	18¼	CIL Inc.	25½
13⅛	5¼	CadillacFairview	8
15⅜	8	Can Cement	13⅛
58¾	18¾	CanNW Energy	25
41¼	29¼	Can Packers	40½
42	18¼	Can Trusco	42
35½	16⅞	Can Imp Bank	35
44⅝	28	Can Pacific	42½
22⅝	13	Can. Pac. Ents	21⅞
31	31½	Can Tire	31
14½	4⅞	Carling O'Kfe	12¾
25¾	18¼	Chieftain	20¾
58¾	34	Cominco	44¾
20	13¾	Cons Bathst A	19¼
8⅛	2.92	Coseka Res	3.30
9¼	4	Costain	8⅛
3.12	0.75	Daon Devel	1.79
57	15⅝	Denison Mines	34¾
26¾	6¾	Dome Mines	22⅞
14⅞	2.58	Dome Petroleum	3.70
44½	27	Dom Foundries	41½
20	13¼	Dom Stores	16¾
26	15½	Domtar	23⅜
72	33	Falcon Ltd	58
25⅝	9¼	Genstar	24¾
28	6¼	Giant Y'knife	23
2.43	1.30	Gt. West Life	1.95
17⅝	10⅞	Gulf Canada	14½
5.87	1.26	Gulf Stream Res.	1.47
18	7⅜	Hawk Sid. Can	13
24½	15½	Hudson Bay Mng	17½
23¼	15	Hudson's Bay	22¼
10½	4.75	Husky Oil	9⅛
37	18	Imasco	34⅛
33¾	20	Imp Oil A	31⅝
15⅞	10	Inco	15¾
18½	9½	Indal	18
27⅞	13¾	Inter. Pipe	27¼
31¼	13¼	Mac Bloedel	27
11⅛	7	Marks & Spencer	11⅜
4.95	2.00	Massey Ferg	2.96
40	22½	McIntyre Mines	25½
57¼	15	Mitel Corp	26
58½	33	Moore Corp	58¼
11¾	5⅜	Nat. Sea Prods A	9⅞
25	11⅝	Noranda Mnes	23
100¾	41½	Nthn. Telecom	85⅜
9⅛	5¼	Nova Alberta	8⅜
19⅛	7	Oakwood Pet	13¼
2.05	0.60	Pacific Copper	1.02
95	52	Pan. Can. Pet	90½
25	15⅝	Patino	23
25⅝	11	Placer Dev	21¾
15⅜	8¼	Power Corp	15
9.62	1.73	Quebec Strgn	7¼
10	5⅛	Ranger Oil	7¾
16	9½	Reed Stenhs A	15⅝
47¼	27¼	Rio Algom	46¼
32⅞	18⅛	Royal Bank	32¼
24⅞	11¾	Royal Trusco A	24
13¾	4.75	Sceptre Res	5.00
36½	19⅛	Seagram	34
27	15⅞	Shell Can Oil	22¼
30⅝	13¼	Steel of Can A	24¼
13¾	4.70	Teck B	9¾
35	21⅞	Texaco Canada	31
32	17¾	Thomson News A	31
47¼	22	Toronto Dom Bk	46⅞
26	13¼	Transalta	21
28	16⅝	Trans Can Pipe	25
23⅛	14⅛	Walker(H) Res	22
15⅞	11⅞	Westcoast Trans	14
54¾	27	Weston (Geo)	52

FRANCE

1982/3 High	1982/3 Low	April 8	Price Frs.
9,294	1,635	Emprunt 4½% 1973	1,872
9,860	5,490	Emprunt 7% 1973	8,060
3,257	2,195	CNE 3%	3,155
512	389	Air Liquide	484
550	380	BIC	481
607	507	Bouygues	570
1,659	1,160	BSN Gervais	1,645
1,000	650	CIT Alcatel	965
1,752	1,255	Carrefour	1,420
682	465	Club Mediter	682
620	440	CFAO	469.5
342	187	Cie Bancaire	342
155	108	Cofimeg	154
94	49.5	Creusot Loire	64.4
925	680	Darty	878
815	595	Dumez	757
458	340	Eaux (Cie Gen.)	390
167.9	98	Elf-Aquitaine	151.2
513	360	Gen. Occidental	502
95	40.5	Imetal	51
267	181.5	Lafarge-Coppee	249.5
1,510	712	L'Oreal	1,451
1,915	1,370	Legrand	1,875
464	317	Maisons Phenix	459
1,765	1,115	Matra	1,500
852	577	Michelin B	790
778	596	Midi (Cie)	778
1,079	540	Moet-Hennessy	1,051
81.5	49	Moulinex	79.5
58.7	36.1	Nord Est	51.5
475	351	Pernod Ricard	475
276	145.5	Perrier	270.5
166	95.1	Petroles (Frq.)	160.8
196	104.1	Peugeot-SA	190
219	75.7	Poclain	90.1
178	106	Printemps (Au.)	120.5
565	149	Radiotech	355
1,074	760	Redoute	997
321.5	204.1	Roussel-Uclaf	311.5
159.2	78.5	Schneider	154.1
193.5	125.5	Sefimeg	193.5
879	474	Skis Rossignol	825
1,165	605	Telemech Elect	1,088
260	119	Thomson (CSF)	207
266.5	200	Valeo	265

GERMANY

1982/3 High	1982/3 Low	April 8	Price Dm
66	33	AEG-Telef	66.5
595.0	375.5	Allianz Vers	595
151.9	109	BASF	149.7
143	103.5	Bayer	141.1
320	179	Bayern-Hypo	318
351	251	Bayern-Verein	351
284	159	BHF-Bank	270
306.5	176	BMW	302
235	163.5	Brown Boveri	180.5
164.3	110	Commerzbank	158
84.7	42	Conti Gummi	84.7
516.8	375	Daimler-Benz	516.8
382.5	203	Degussa	379
180	116	Demag	171
216	125	D'sche Babcock	165
338	245	Deutsche Bank	326.9
174.3	113	Dresdner Bank	171.5
215	155.1	GHH	175.8
342	233.9	Hochtief	334
147.8	103.7	Hoechst	146
47.9	19.5	Hoesch	46.3
564	384	Holzmann (P)	540
150.5	102	Horten	146
184.7	134	Kali und Salz	167
377	178	Karstadt	277
250.8	150	Kaufhof	247.5
248	168	KHD	245
62.7	32.5	Kloeckner	43
74	49	Krupp	74
363	262.5	Linde	362
125	51	Lufthansa	122.7
197	129.5	MAN	185.5
176	136.4	Mannesmann	170.3
452	201	Mercedes Hlg	452
272	191.5	Metallgesell	233
910	510	Muench Rueck	902
247.5	171.5	Preussag	245
199	160.5	Rhein West Elect	189
308	215	Rosenthal	299
339.5	263	Schering	334
337.9	198.2	Siemens	334.3
92.1	65.1	Thyssen	83
161.3	132.2	Varta	159.9
167	117	Veba	155
144.5	99.5	V.E.W.	135.5
320	262	Verein-West	314
182	126	Volkswagen	174.3

ITALY

1982/3 High	1982/3 Low	April 8	Price Lire
39,900	30,000	Banca Com'le	32,050
295	63	Bastogi IRBS	270
3,950	1,649	Centrale	2,500
9,800	3,690	Credito Varesino	4,600
5,121	1,479	Fiat	2,053
83.6	24	Finsider	65
169,000	104,125	Generale (Assic)	151,500
3,400	1,520	Invest	2,522
46,500	21,500	Italcementi	41,750
160.25	81.25	Montedison	142
3,100	1,950	Olivetti	2,635
3,470	2,050	Pirelli Co	3,691
1,950	1,149	Pirelli Spa	1,740
1,050	580	Snia Viscosa	970
20,100	9,900	Toro Assic	13,500
15,890	8,320	do. Pref	10,399

NETHERLANDS

1982/3 High	1982/3 Low	April 8	Price Fls
175	83	ACF Holding	171
172.5	80	Ahold	166
59.6	21.9	AKZO	59.1
352.5	22.8	ABN	352
125.1	78.0	AMEV	119
62.7	34.5	AMRO	61.7
204.5	104	Bredero Cert	193.9
70	29.5	Boskalis Westm	45.1
47.5	25.3	Buhrmann-Tet	43.5
57	24.4	Caland Hldgs	53
289.5	131.2	Elsevier-NDU nv	289
146.5	106	Ennia	144
31.5	25	EuroCom Tst	31.5
166	81.5	Gist-Brocades	153.5
140.5	47.5	Heineken	140.5
24.7	11.5	Hoogovens	23.9
16.9	3.0	Hunter Douglas	15.5
26.7	13.3	Int-Muller	24.1
169.5	81.5	KLM	146.5
57	20	Naarden	53.5
149.8	104.8	Nat Ned Cert	149.5
37.3	22	Ned Cred Bank	29.8
155.5	99.5	Ned Mid Bank	155.5
141	88	Nedlloyd	109.1
197	68.0	Oce Grinten	191
40.2	17	Ommeren (Van)	23.7
60	34.8	Pakhoed	53.7
45.8	27.1	Philips	45.8
58	3.0	Rijn-Schelde	2.2
279.5	155	Robeco	257
128.9	117.9	Rodamco	128.5
260	188.80	Rolinco	260
188.7	135.3	Rorento	188.5
119.5	71.8	Royal Dutch	112.6
95.3	27	Slavenburg's	60
243	175	Tokyo Pac Hg	240
222	145	Unilever	215.8
140	92	Viking Res	116
72	38	VMF Stork	66.3
92	43.7	VNU	77
150	41	West Utr Bank	124.5

NORWAY

1982/3 High	1982/3 Low	April 8	Price Kroner
122	98	Bergens Bank	109.5
154	83	Borregaard	154
137.5	108	Christiania Bk	115
153	113	Creditbank	126.3
79	35	Elkem	76
292.5	74	Norsk Data	224
366	248.5	Norsk Hydro	326
246	120	Storebrand	142

AUSTRALIA

1982/3 High	1982/3 Low	April 8	Price Aust. $
4.76	3.30	ANZ Group	5.6
1.69	0.82	Acrow Aust	1.2
1.80	0.51	A.O.D.	0.58
1.73	1.13	Ampol Pet	1.5
1.95	1.45	Assoc Pulp Pap	1.85
1.78	1.04	Aust Cons Ind	1.20
2.82	2.00	Aust Guarant	2.26
3.15	2.00	Aust Nat Inds	3.15
2.15	1.50	Aust Paper	1.82
2.70	0.85	Bond Hldgs	1.0
3.30	1.95	Boral	2.56
2.50	1.00	B'ville Copper	2.35
2.60	1.85	Brambles Inds	2.58
4.55	2.15	Bridge Oil	2.95
10.45	3.00	BHP	6.73
4.7	3.40	CRA	4.70
4.00	2.45	CSR	2.82
2.75	1.70	Carlton & Utd	2.46
4.50	3.27	CastlemaineTys	3.95
2.52	1.94	Coles (G.J.)	2.59
2.50	1.45	Comalco	2.40
0.71	0.12	Consolidated Pet	0.12
3.00	0.88	Costain	0.88
1.15	0.88	Dunlop	1.05
5.76	3.10	E.Z. Inds	5.5
4.40	2.40	Elders IXL	2.80
1.66	1.32	Energy Res	1.37
1.85	1.46	Gen Prop Trust	1.6
5.54	3.40	Griffin Coal	5.00
4.15	2.75	Hardie (J.)	3.55
3.90	1.55	Hartogen Energy	1.55
3.10	1.27	HeraldW'y Times	2.05
1.95	1.35	ICI Aust	1.59
0.50	0.10	Jimb'lana (50cFP)	0.29
0.80	0.20	Kia Ora Gold	0.22
4.00	2.95	Lend Lease	3.75
0.60	0.06	Lennard Oil	0.05
4.55	2.41	MIM	4.42
9.70	1.80	Mayne Nickless	2.55
5.80	1.65	Meekatharra Ms	1.75
1.60	0.50	Myer Emp	1.45
2.86	2.26	Nat. Aus. Bk	2.55
3.15	1.65	News	3.15
2.00	1.15	Nicholas Kiwi	1.96
2.72	1.29	North Bkn Hill	2.40
2.07	1.00	Oakbridge	1.08
1.15	0.28	Otter Expl	0.80
2.55	1.17	Pancon	1.45
1.80	1.17	PioneerConc	1.50
2.40	1.55	Reckitt & Coln	1.75
1.04	0.80	Repco	0.97
7.00	3.83	Santos	4.8
5.40	3.00	Smith (H.)	3.02
0.60	0.12	Southland Min'g	0.30
0.37	0.12	Spargos Expl	0.29
2.57	1.35	Thos Natwide	1.52
5.00	1.90	Tooth	3.0
9.24	1.75	UMAL Cons	1.65
11.5	4.70	Vamgas	5.5
4.88	2.51	Western Mining	4.45
6.05	2.43	Westpac	3.47
1.26	0.64	Woodside Petrol	0.76
1.88	1.39	Woolworths	1.75
3.25	2.25	Wormald Intl	3.85

SINGAPORE

1982/3 High	1982/3 Low	April 8	Price $
2.28	1.38	Boustead Bhd	2.15
5.05	2.75	Cold Storage	4.9
9.5	5.50	DBS	9.5
8.3	4.62	Fraser & Neave	8.3
6.00	2.44	Genting	5.80
3.70	1.98	Haw Par	3.57
3.12	1.74	Inchcape Bhd	3.10
8.25	4.94	Malay Banking	7.50
6.35	4.24	Malay Brew	5.55
19.7	5.25	OCBC	11.9
2.89	1.49	Sime Darby	2.40
2.33	1.25	Straits S'mship	2.07
7.5	3.92	Straits Trdg	6.95
4.96	3.12	UOB	4.50

SWEDEN

1982/3 High	1982/3 Low	April 8	Price Kronor
337	185	AGA	315
450	197	Alfa-Laval	370
510	157	ASEA (Free)	375
1,560	600	Astra	1,475
146	85	Atlas Copco	125
397	156	Boliden	327
740	366	Cardo (Free)	695
635	312	Cellulosa (Free)	550
213	21	Electrolux B	187
410	115	Ericsson	410
270	115	Esselte (Free)	215
590	120	Fagersta	350
475	91	Fortia (Free)	450
290	99	Mooch Dom	240
322	121	Saab-Scania	295
300	159	Sandvik B (Free)	270
370	335	Skandia	366
260	183	Skan Enskilda	215
193	87	SKF B	158
546	255	St. Kopparberg	475
162	95	Sven Handelsbn	140
261	100	Swedish Match	215
415	119	Volvo B (Free)	415

SWITZERLAND

1982/3 High	1982/3 Low	April 8	Price Frs.
575	380	Alusuisse	515
4,315	2,650	Bank Leu	4,000
1,125	615	Brown Boveri	1,150
1,860	1,155	Ciba-Geigy	1,800
1,495	910	do. (Part Certs)	1,490
2,310	1,535	Credit Suisse	1,940
2,775	2,190	Elektrowatt	2,670
590	360	Fisher (Geo)	580
3,900	2,890	Genevoise	3,800
82,000	55,750	Hoff-RochePtCts	79,500
8,200	5,375	Hoff-Roche 1/10	7,950
5,950	4,700	Jacobs Suchard	5,700
1,650	1,160	Jelmoli	1,500
1,330	640	Landis & Gyr	1,235
3,995	3,070	Nestle	3,895
1,485	850	Oer-Buehrle	1,450
265	210	Pirelli	265
6,575	3,950	Sandoz (Br)	6,225
808	497	Sandoz (Pt Cts)	765
385	258	Schindler (PtCts)	360
880	510	Swissair	806
331	260	Swiss Bank	321
7,425	5,500	Swiss Reinsce	7,150
1,560	850	Swiss Volksbk	1,345
3,400	2,680	Union Bank	3,400
2,910	2,050	Winterthur	2,875
17,850	12,300	Zurich Ins	17,250

HONG KONG

1982/3 High	1982/3 Low	Apr. 8	Price H.K.$
33	16.5	Bank East Asia	32.75
3.05	0.51	Carrian Invest	0.87
22.50	6.8	Cheung Kong	10.30
17.80	10.5	China Light	14.50
6.65	1.55	Hang Lung Devel	2.95
130	30.25	Hang Seng Bank	46.25
8.70	3.9	HK Electric	5.95
5.95	2.19	HK Kowloon Wh	3.97
9.65	2.2	HK Land	4.32
12.20	7.2	HK Shanghai Bk	9.20
37.75	25	HK Telephone	36
18.50	8.2	Hutchison Wpa	14.6
18.50	11.3	Jardine Math	14.3
5.15	2.2	New World Dev	3.65
2.65	2.02	Orient O'seas	2.50
6.35	3.85	O'seas Trust Bk	4.45
8.20	3.35	SKH Props	7.30
13.6	5.45	Swire Pac A	13.5
6.90	2.60	Wheel'k Mard A	5.62
5.20	1.75	Wheel'k Marit'e	2.10
3.25	0.79	World Int. Hldgs	1.60

JAPAN

1982/3 High	1982/3 Low	Apr. 8	Price Yen
949	751	Ajinomoto	815
2,180	782	Alps Electric	1,960
630	403	Amada	590
335	225	Asahi Chem	299
715	430	Asahi Glass	650
500	392	Bridgestone	475
1,320	843	Canon	1,210
1,170	662	Casio Comp	1,080
1,270	652	Chugai Pharm	1,090
413	200	Citizen	391
658	595	Daiei	604
756	360	Dai Nippon Ptg	748
574	365	Daiwa House	569
469	330	Ebara	395
1,450	759	Eisai	1,200
6,780	3,580	Fanuc	4,520
508	490	Fuji Bank	500
2,000	1,190	Fuji Film	1,650
1,270	1,003	Fujisawa	1,070
960	559	Fujitsu	883
2,390	1,480	Green Cross	1,520
650	450	Hasegawa	510
609	475	Heiwa Real Est	590
838	541	Hitachi	773
1,480	1,010	Hitachi Credit	1,430
960	522	Honda	811
1,130	900	House Food	909
909	519	Hoya	941
348	231	Itoh (C)	321
1,190	770	Ito-Yokado	1,080
1,160	498	Iwatsu	1,000
629	360	JACCS	385
9,480	2,130	JAL	8,310
714	416	Jusco	599
375	310	Kajima	332
590	470	Kao Soap	530
875	580	Kashiyama	644
446	355	Kirin	409
1,010	385	Kokuyo	910
585	430	Komatsu	488
756	519	Konishiroku	595
540	320	Kubota	338
473	324	Kumagai	414
4,940	3,060	Kyoto Ceramic	4,750
542	314	Maeda Const	542
900	486	Makino Milling	NT
1,000	580	Makita	930
340	268	Marubeni	302
701	509	Marudai	572
1,050	785	Marui	960
1,450	902	MEI	1,310
625	438	M'ta Elec Works	600
506	484	M'bishi Bank	500
636	470	M'bishi Corp	623
393	214	M'bishi Elect	364
529	403	M'bishi Estate	529
260	162	MHI	217
430	276	Mitsui Co	417
794	358	Mitsui Estate	756
420	308	Mitsukoshi	365
1,200	431	NGK Insulators	478
284	156	Nihon Cement	232
1,400	530	Nippon Denso	1,280
1,000	662	Nippon Elect	911
255	138	Nippon Express	235
759	310	Nippon Gakki	655
194	115	Nippon Kokan	140
1,130	791	Nippon Oil	897
632	348	Nippon Seiko	453
995	635	Nippon Shinpan	831
183	133	Nippon Steel	165
335	208	Nippon Suisan	335
4,470	3,600	NTV	4,300
318	202	Nippon Yusen	261
866	705	Nissan Motor	735
364	310	Nisshin Flour	350
170	128	Nisshin Steel	153
710	381	Nomura	672
1,350	753	Olympus	1,090
1,690	791	Omron Tateisi	1,070
9,830	1,225	Orient Leasing	8,620
2,580	1,310	Pioneer	2,400
902	566	Renown	850
768	443	Ricoh	701
875	515	Sankyo	724
515	354	Sanyo Elect	455
377	325	Sapporo	363
796	646	Sekisui Prefab	736
8,810	5,990	Seven Eleven	8,750
1,320	632	Sharp	1,220
514	386	Shimadzu	460
947	662	Shionogi	800
1,040	781	Shiseido	922
4,450	2,960	Sony	3,500
498	381	Stanley	460
519	452	S'tomo Elect	496
300	195	S'tomo Marine	240
249	115	S'tomo Metal	154
526	450	Taihei Dengyo	500
300	215	Taisei Corp	252
738	560	Taisho Pharm	722
1,090	750	Takeda	790
5,520	3,080	TDK	4,240
296	184	Teijin	261
1,030	705	Teikoku Oil	815
549	400	Tokyo Marine	530
568	405	TBS	540
1,170	795	Tokyo Elect.Pwr	1,040
133	103	Tokyo Gas	126
662	385	Tokyo Sanyo	524
1,320	792	Tokyo Style	820
346	199	Tokyu Corp	332
544	435	Toppan Print	539
469	309	Toray	363
394	260	Toshiba	312
544	385	TOTO	518
575	385	Toyo Seikan	560
1,110	806	Toyota Motor	1,040
2,890	1,650	Victor	2,850
780	556	Wacoal	703
936	525	Yamaha	665
1,510	1,040	Yamanouchi	1,500
600	505	Yamazaki	533
318	210	Yasuda Fire	306
551	386	Yokogawa Bdge	450

SOUTH AFRICA

1982/3 High	1982/3 Low	Apr. 8	Price Rand
4.55	3.10	Abercom	3.80
9.9	6.00	AE & CI	8.45
39.25	20	Anglo Am. Coal	34.75
27	13.90	Anglo Am	21.60
160	58.00	Anglo Am. Gold	128
19	7.40	Barclays Bank	14
15.25	6.55	Barlow Rand	12.15
77	24.5	Buffels	59
12.00	4.95	CNA Invest	12.0
5.5	1.95	Currie Finance	5.5
10.0	3.97	De Beers	8.70
49.75	18.75	Driefontein	38
72.5	19.8	FS Geduld	49.5
150	46.25	Gold Fields S.A.	138
6.05	3.7	Highveld Steel	5.05
19.6	4.95	Nedbank	11.1
27.75	14.50	OK Bazaars	25.5
3.7	1.85	Protea Hldgs	2.75
21	8.10	Rembrandt	19.75
9.5	3.3	Rennies	9.5
8.8	2.59	Rust Plat	8.05
4.8	3.0	Sage Hldgs	4.7
7.75	5.75	SA Brews	7.35
21	12.00	Smith (C.G.)	19.5
9.7	5.5	Tongaat Hulett	9
5	2.95	Unisec	4.5

SPAIN

1982/3 High	1982/3 Low	Apr. 8	Price %
366	206	Bco Bilbao	259
362	229	Bco Central	309
324	200	Bco Exterior	205
357	200	Bco Hispano	240
367	300	Bco Santander	259
395	270	Bco Vizcaya	370
150	84	Dragados	151
68.5	47	Hidrola	66.5
59	39	Iberduero	49.7
104.5	50	Petroleos	93.5
74	50	Telefonica	68.5

NOTES—Prices on this page are as quoted on the individual exchanges and are last traded prices. § Dealings suspended. xd Ex dividend. xc Ex scrip issue. xr Ex rights. xa Ex all.

AMERICAN STOCK EXCHANGE PRICES

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12 Month High	12 Month Low	Stock	Div.	Yld.	P/E	Sls 100s	High	Low	Close Quote	Ch'ge Prev. Close
45	24¼	REInv	2.40e	8.1	18	16	30½	30¼	30½	+¼
7½	3¼	Ritncl			27	1	7⅛	7⅛	7⅛	
1⅞	9-16	Redlaw				22	1⅛	1⅛	1⅛	
6⅞	2½	Rehrnm				12	5⅛	5	5	
14¼	8	RegalB	.72	5.5	16	10	13¼	13⅛	13⅛	-⅛
13⅞	5⅞	RepGyp	.40	2.1	19	8	12¾	12⅝	12¾	-⅛
31⅝	15¼	ResrtA			14	465	30¼	28⅝	29¼	
2	1⅝	Resrt	wt			43	2⅛	2⅛	2⅛	
9	3¼	RstAsc			11	77	8⅛	8	8⅛	+⅛
4⅝	2⅞	RexNor				45	4	3⅞	4	+⅛
14⅞	4⅝	RibletP	.12	1.0	20	15	12⅝	12¼	12⅝	+⅛
11½	2	RchTC	v			35	3⅛	3½	3⅛	+⅛
18½	5	RTC	pfv			9	7½	7	7½	+½
38½	20⅝	RioAlg	g1.50			2	37¼	37¼	37¼	
5	1⅞	RioGDr			4	42	2⅜	2⅛	2⅜	
5⅞	2	Robinc				8	4⅝	4⅛	4⅝	+⅛
28⅝	10½	Rckway	1	1.8	30	72	27½	26¾	27½	+½
23¼	12	Rogers	.12	1	81	20	22⅞	22	22	-½
3⅞	1⅞	Roncol				8	3⅛	3⅛	3⅛	
3½	1⅛	RoyPlm				14	2¼	2⅛	2¼	
20¼	13	Rudick	.56a	2.8	8	1	19¾	19¾	19¾	+¼
4⅞	1⅞	RSW				19	3⅞	3⅞	3⅞	-⅛
27⅞	12	Russell	.44	1.7	15	4	26	26	26	+⅛
14⅝	7⅛	Rykoff	.50	3.7	13	59	13¾	13⅛	13½	
54½	11⅞	Rylend	.84	1.7	36	130	51¼	49⅜	49⅝	+⅛
S—S—S										
10¼	3⅞	SFM				25	5⅝	5⅜	5⅜	
14½	10⅛	SGL	.36b	2.8	10	2	12⅞	12⅞	12⅞	-⅛
9½	1⅛	SMD	s		13	50	8⅞	8⅝	8⅝	-⅜
5⅞	1	SSP				3	5⅝	5⅝	5⅝	
11¼	5½	Sage			7	85	8¼	8⅛	8⅛	
11½	2	Salem	.40	3.8	10	9	10⅝	10½	10⅝	+¼
3¾	1⅞	SCarlo	.15e	4.4	5	12	3⅜	3¼	3⅜	+⅜
7¾	5½	SDgo	pf.88	12.		1	7½	7½	7½	
8⅞	6¼	SDgo	pf 1	12.		2	8½	8¼	8¼	
21	15¼	SDgo	pf2.47	12.		3	20¾	20¼	20¾	+⅜
37	28⅛	SDgo	pf4.65	13.		2	35¾	35¾	35¾	
22¾	16⅞	SDgo	pf2.68	12.		17	22½	22	22	-½
39	25⅛	SFrRE	2.20	6.4	14	7	34⅝	34¼	34¼	
33¾	19	SanJW	2.40	8.1	7	3	30	29¾	29¾	-⅛
21	6⅞	Sandgt	s.60	3.8	9	8	15⅝	15⅝	15⅝	
7	3⅞	Sargent			18	30	6	5⅞	5⅞	-⅛
23⅛	9⅝	Scheib	.50b	2.5	12	5	20⅝	20¼	20¼	
18	3⅞	Schrad	.20	1.3	10	12	16⅞	15⅞	15⅞	-⅛
12⅞	5⅝	Schwab	.40	3.7	10	2	10⅞	10⅝	10⅝	-⅜
28⅞	3⅝	SciMgt	.10	.5	16	67	21¼	20½	21	-⅛
28⅞	6⅞	SciLsg	n		18	104	23	22⅝	23	+½
32½	21	Scope	.25	.8	2	11	31⅝	30⅞	30⅞	-¾
2	⅜	Seaport			200	39	2	2	2	+⅛
5¼	2⅞	Seapt	pf			z100	5¼	5¼	5¼	
11½	3½	SecCap			12	61	11	10⅞	11	
9⅛	3⅞	SelsPro			8	93	7⅞	6⅞	7⅝	+⅛
10	3⅞	SelsDt				19	5⅝	5¼	5½	+¼
5⅞	2⅞	Seles				1	4⅝	4½	4⅝	+¼
3	1½	SelgAs	n			13	2½	2⅜	2⅜	-⅛
7⅛	2⅞	Semtch	.10i	1.7		36	6	5⅞	6	+⅛
12	8	Srvsco	.44	3.7	10	21	12	11⅞	12	+⅛
15½	5⅛	Servo			40	3	12¾	12⅝	12¾	-⅛
7⅞	2½	Servotr			8	35	6⅞	6½	6½	-⅛
25¼	7¼	Seton	s.36	1.5	14	15	24¼	23⅞	23½	-⅛
6⅞	4⅝	ShaerS	.15e	2.5		5	6⅛	6	6	-⅛
4	1⅞	Sharon				8	3⅞	3⅝	3⅞	+⅛
30	6½	Shopwl	.04r	.1	2	17	29⅞	29	29½	+⅝
20½	11	Showbt	.80	4.2	10	25	19	18⅞	18⅞	-⅛
12⅞	5½	Sierrn			35	65	10⅝	10⅜	10⅝	+⅛
8¼	5⅛	Silco	.20	2.5	5	1	7⅞	7⅞	7⅞	-⅛
20¼	7⅞	SlvasA	.30	1.7	48	1	18	18	18	
9¼	2¼	Slvrcst				45	9	8⅞	9	
5⅞	3¼	SimcoS	.25	5.6	17	6	4½	4½	4½	-⅛
13⅞	10	Snyder	n2	16.	10	42	12½	12¼	12½	+⅛
9½	3¼	SolSdSc				20	7¼	7	7¼	
8⅞	4¼	Solitron				80	7¼	7½	7⅞	-⅛
5⅞	½	Sotex	v			40	1½	1⅜	1½	+1
13¼	8⅞	SoetCap	.85e	8.5	6	14	10	9⅞	10	+⅛
9½	6⅞	SCEd	pf1.02	11.		23	9¼	9⅛	9⅛	
9⅞	7⅛	SCEd	pf1.06	11.		45	9⅞	9⅝	9⅝	+⅛
10	7¼	SCEd	pf1.08	11.		59	9⅞	9½	9⅝	
13¼	9½	SCEd	pf1.45	11.		47	13	12⅞	13	-⅛
30¼	23½	SCEd	pf1.30	4.5		4	29	28⅞	28¾	-¼
21	15¼	SCEd	pf2.30	11.		1	20¼	20¼	20¼	
20¼	14½	SCEd	pf2.21	12.		4	18⅞	18⅞	18⅞	
82¼	60	SCEd	pf8.96	11.		28	80⅞	80⅜	80⅞	+¼
4⅛	1½	Sonrk	wtC			837	3⅞	3⅛	3⅞	-⅛
11½	3½	Spiktran			48	72	10⅛	9⅞	10¼	+⅛
9½	5⅞	Sprk	pf1	12.		1	8⅛	8⅛	8⅛	-⅛
23⅞	4⅞	Spectro	s.14	.8	13	54	22½	22	22⅛	+⅛
5	2⅞	SpedOP	.10r	2.5	22	2	4⅛	4⅛	4⅛	
13	6½	Spencer	.08	.8		39	10	9¾	10	+⅛
18	4⅛	StdMed				60	14¼	14	14⅛	-⅛
44½	9¾	StPrd	s.80	1.8	14	47	u45	43⅞	44⅞	+1⅛
47¼	34¼	StdShr	3.91e	9.0	7	2	43½	43⅛	43⅛	-⅛
12⅞	4⅞	Stanwd			13	25	11⅛	11	11⅛	-⅛
9⅞	2⅞	StarrtH			283	10	8½	8¼	8½	+⅛
11⅞	8¼	Statex			42	64	8⅞	8¼	8¼	-¼
15¼	9¼	StepnCh	.56	4.5	9	19	12⅜	12⅛	12⅜	
⅞	3-16	StrlB	wt			10	⅛	⅛	⅛	-1-16
7⅛	3⅞	StrlCap				9	7½	7⅜	7⅜	+⅛
4	⅞	SterlEl				143	2⅛	2⅛	2⅛	
6½	1⅞	StrlExt			11	2	5⅞	5⅞	5⅞	
17¼	15⅛	StorEq	n1.52e	9.5	17	19	16	16	16	
5	2⅞	StrutW				5	3	3	2	
9⅛	5⅞	SumtE			64	58	5⅞	d5⅛	5⅛	-⅛
15⅞	12¼	SumtE	pf1.80	12.		8	14¼	14¼	14¼	-¼
18⅞	7⅞	Sunair	.40	2.2	18	128	18¼	17⅞	18	+⅛
11¼	4⅞	Sundnc				59	5¼	5¼	5¼	
13⅞	7¼	SunJr	.48	3.7	13	13	13⅛	13¼	13⅛	-¼
25⅛	11⅛	SupFdS	.48b	1.8	13	88	u27¼	25⅝	27	+1⅞
6½	1⅞	SupCre			128	127	5⅛	4⅞	5⅛	+⅛
11½	2⅛	SupInd			13	58	10⅞	9⅞	10⅛	+⅛
13⅞	5½	SuprSr	.24	2.0	13	12	12⅛	12	12	-¼
10¼	5¼	Susqh	pf			2	9¼	9¼	9¼	-½
37⅞	13⅞	Switln	1.04e	2.9	8	35	36⅝	35⅞	36⅛	-⅛
7⅛	3¼	Synaloy				13	6⅞	6½	6⅞	
12⅞	7¼	SystEn	.10	1.0	12	13	10⅛	10	10⅛	-¼
8	2⅞	SysPln				106	8	7⅞	8	
T—T—T										
14	6⅞	TBar	s.57t	5.2	84	20	10⅞	10½	10⅞	+⅛
11¼	6¼	TEC	.08	1.1		7	7½	7½	7½	+⅛
56¼	14⅛	TIE			38	787	47	45⅛	45¾	-1
15¼	6⅞	TII				12	11⅞	11⅝	11⅞	+⅛
26¼	7⅞	TabPr	s.20	.8	20	18	24⅞	24⅛	24⅝	+⅜
19½	7¼	TandB	s.08j			4	15⅛	15⅛	15⅛	-⅛
11	6¼	Tasty	.05e	1.4	14	13	9⅛	9⅛	9⅛	-⅛
10½	3⅞	TchAm			381	32	7⅛	7⅛	7⅛	+⅛
18⅜	8⅛	TchSym			21	137	16¼	15⅞	16¼	+⅛
28½	14	TechOp			15	24	23¾	23⅛	23¾	+⅛
5	3	TechTp			9	35	4⅛	4½	4⅛	+¼
33⅞	8¼	Tcham	s		143	730	22⅝	21¼	21¾	-⅝
13⅞	6	Technl	.40	3.6	7	2	11¼	11¼	11⅛	+⅛
90	38½	TelonR	.25e	.3	74	z450	75¾	73¼	75¾	+2⅜
35¼	16⅞	Teflex	.38	1.1	14	73	32⅜	31½	32⅜	+⅜
16⅞	8⅞	TelDta	.32e	2.1	14	24	14	13⅞	14	+¼
28⅞	13⅛	Telect			35	158	22¼	21½	21⅞	
17⅞	11⅛	Telsph	n		91	327	15¼	14½	14⅞	-⅛
6⅞	3⅞	Teney	s		18	11	5⅞	5¼	5⅞	-⅛
12	8⅞	Tensor				32	10	10	10	-¼
28⅞	19½	TexCd	g1			3	25¼	25¼	25⅞	+⅛
13⅞	4⅛	TexAir	.16	1.6		285	10⅛	9⅞	10	
7⅞	3⅞	TexAE				78	3⅞	3¾	3⅞	
25	9¼	Texscn	s		27	92	22	21¼	22	
5	2	ThorEn			17	5	2⅞	2⅞	2⅞	-⅛
13	8⅞	ThreeD	.24	2.1	8	1	11⅜	11½	11⅜	+⅛
11½	8	Tidwell			48	31	11⅛	11	11⅛	+⅛
35½	28¼	TolEd	pf4.25	13.		z150	32¼	31¼	32¼	+½
33⅞	4⅞	ToppsG	.20	.7	8	32	30⅜	29⅞	30½	+1⅛
13⅞	4⅞	Tortel				35	8⅞	8⅜	8⅞	+½
13	7	TotlPt	g.24		32	5	11⅛	11⅛	11⅛	+⅛
8¼	4⅞	Towner	e		18	69	5⅞	5⅛	5⅛	-⅛
4⅞	1⅞	Town	wt			64	2	1⅞	1⅞	-⅛
1⅞	7-16	Tralgr				245	1½	1⅜	1½	+⅛
18¼	7⅞	TmsLx	.10	.7	11	10	14⅛	14⅛	14⅛	+⅛
11⅛	3⅞	TranEn				58	4⅛	4⅛	4⅛	
3⅞	1	TmE	wt			6	1⅛	1	1⅛	+⅛
19⅞	8⅞	TmsTec	.40	2.4	12	32	17	16⅞	17	
2½	⅞	TubMx			2	124	1½	1⅜	1⅜	-⅛
38¼	9⅛	Tubox	.60	1.8	19	22	33⅜	33⅜	33⅝	+¼
41	20¼	TurnrC	2	5.3	7	7	38⅛	38	38	-¼
6¼	1⅛	TwrF	v			46	3⅞	3¼	3⅞	+⅛
U—U—U										
14½	7	UAI				3	11⅞	11⅞	11⅞	+⅛
14½	9⅞	URS	n			28	12⅞	12	12⅞	
3⅞	1⅛	USR	ind		16	17	3⅛	3	3⅛	
21	6⅞	Ultmte			28	114	19¼	18⅜	19	+¼
18⅞	8½	Unicorp	.40	2.1	22	12	u19½	18⅞	19½	+⅜
11¼	6¼	Unimax				5	10⅛	10⅛	10⅛	+¼
22	10⅛	UAirPd	s.52	2.6	12	8	20	19⅞	19⅞	-¼
6⅞	3¼	UnAsbt			4	62	5¼	5	5¼	+⅛
6	2⅞	UnFood	.20	2.7	12	36	5⅞	6¼	5⅞	
16⅞	5⅛	UtMed	1.04t	7.8	21	21	13⅞	13⅜	13⅜	-⅛
20¼	13⅛	UNatCp				1	20⅛	20⅛	20⅛	
18	10⅛	UnRlIn	1.33e	8.2	13	8	16⅛	16⅛	16⅛	-⅛
20⅞	5⅞	USAG	wt			11	17⅞	17⅞	17⅞	
17⅛	13⅞	UnvC	s		32	31	15⅛	15⅛	15⅛	-⅛
13⅞	6	UnivRs			17	286	8⅞	8½	8⅞	+⅛
20⅞	6⅞	UnvRu			12	2	19⅛	19⅛	19½	+⅛
V—V—V										
20	8⅞	Valmac	1.25e	6.5	8	3	19	19	19	
35¼	10⅞	Valspar	.68	2.1	12	82	33⅜	32⅞	33	+1
44⅞	11⅛	Verbtm	s		84	224	38⅛	37⅛	37⅞	-¼
3⅞	1⅛	Verit			28	70	u3⅞	3⅛	3⅞	+½
16½	6½	VtAmC	.36b	2.3	11	23	16	15⅞	15⅞	-⅛
15⅞	7¼	VtRsh	.15e	.9	47	120	u16	15⅜	16	+⅛
7	1¼	Verna	1.25t	62.		14	2⅛	2	2	-⅛
16¼	7¼	Vernit	.12	.8	14	20	14⅞	14¼	14⅞	
11½	2⅞	Vetech			8	4	6⅞	6⅝	6⅞	-⅛
13⅞	4⅞	Vicon			25	50	11⅞	11⅝	11⅞	-⅛
13¼	1	Virco	.04	.3	8	4	11½	11⅛	11½	
2¼	¼	VisnEn				489	½	7-16	7-16	-1-16
17⅛	7¼	Vishay			12	22	15⅞	15⅞	15⅞	+⅛
11¼	4⅛	VisualG	.26	3.3	10	1	8	8	8	
10¼	4⅞	VolMer	.16e	2.2	14	182	8⅞	7½	8¼	+⅛
20⅞	7⅞	Voplex	.56	3.4	16	36	16⅞	16⅛	16½	+⅛
14¼	8⅞	VulcCp	.36	2.8	8	2	12⅞	12⅞	12⅞	
W—W—W										
7⅛	4⅞	WTC				288	7⅞	6½	7⅛	+⅛
38½	17	Welbar	.40	1.4	11	7	28⅞	28½	28½	-⅛
18¼	7½	Waico	s.40	3.6		5	11½	11¼	11¼	-⅛
6⅞	2⅞	WallsS			21	11	6¼	6⅛	6⅛	-⅛
37	12⅝	WangB	s.10	.3	33	3021	33⅞	31⅞	33⅞	+1
37⅛	10⅛	WangC	s.05	.2	33	21	33⅛	32	33	+1½
18⅞	4⅛	Wards	s.10	.5	20	57	18⅛	17⅞	18⅛	+⅞
21¼	8¼	WrnC	wt			165	10⅛	9⅞	9⅞	-⅛
15	1	WshHm			74	11	11⅛	10⅛	11⅛	+⅛
64¼	30¼	WshPst	.68	1.1	17	71	63	62	62	+1
17⅞	11½	WRIT	1.08	6.4	17	35	17	16⅞	17	
12⅞	8¼	Wshco	s.20	2.8	18	8	11	10⅞	10⅞	-¼
19¼	5	Wthfrd			48	110	9⅞	9½	9½	-⅛
28	7⅞	WebcrE	n		28	265	21⅞	21¼	21⅞	-¼
17⅛	8	WeldT	e.10	.9		8	11⅞	11⅛	11⅛	-⅛
13⅞	3⅛	Wshm	s		15	1	10⅛	10⅛	10⅛	-⅛
18¼	7	WstGrd	.50	6.5	5	51	7⅞	7⅞	7⅞	
16	7⅞	Wesco	.54	3.5	10	12	15¼	15⅛	15⅛	-⅛
24½	7⅞	Wesprp			9	57	10⅛	10	10⅛	
14	7	Westr	g.40			140	11⅛	11⅛	11⅛	
30⅞	5½	WstnSL				30	26⅞	26	26⅛	-⅛
3⅞	1⅛	WshCht				2	2⅞	2⅞	2⅞	+⅛
8⅞	4	Wchita				98	5⅝	5½	5½	-⅛
6	1⅞	WilcxG			60	99	5⅛	5⅛	5⅛	
23⅞	14⅛	Winrcp	pf1.44		27	5	22⅞	22⅞	22⅞	+⅛
18⅞	6⅞	Wnkim	.50	3.9	20	3	13⅛	12⅞	13⅛	+⅛
41	32¼	WisP	pf4.50	11.		z20	40	40	40	-½
4½	1⅞	WolfHB			100	21	4	4	4	
8⅞	5⅞	Wdstrm	.40	5.0		10	8	7⅞	8	+⅛
12⅞	7⅛	WkWear			93	125	10⅞	10	10⅞	
9¼	4⅞	WwdeE			64	38	5⅞	5⅜	5⅜	-⅛
30	19⅛	Wrathr	.05	.2		45	28⅞	27⅛	28⅛	+1⅛
9⅞	1⅞	WrgtH	g		22	28	6⅞	6⅞	6⅞	-¼
X—Y—Z										
11	5⅞	YankO			9	11	11	10⅞	10⅞	+⅛
14⅞	5	Zimer	s.10	.8	29	54	13⅞	12½	13⅛	+⅛

NEW YORK PRICES

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12 Month High	12 Month Low	Stock	Div.	Yld.	P/E	Sls 100s	High	Low	Close Quote	Ch'ge Prev. Close
23½	12⅞	Wiliam	1.20	5.5	19	323	22	21⅞	22	
18⅛	9⅞	WilmEl	.60	4.9	8	680	12⅞	12¼	12¼	-⅛
11¼	6	WilshrO	.07i	1.1	6	408	6⅞	6⅛	6⅛	+¼
50¼	33⅞	WinDx	2.40	5.1	11	55	47⅛	46⅞	47	+¼
16⅞	5⅛	Winnbg	.10e	.7	39	936	15¼	14⅛	15⅛	-⅛
9	3⅛	WinterJ			109	155	9	8⅛	8⅞	+⅛
25¼	19¼	WisEP	s1.84	5.0	7	95	24⅞	24	24⅞	
83¼	63½	WisE	pf6.90	11.		z200	83	82⅞	83	+2
23⅞	18⅞	WisG	pf2.55	10.		15	25⅞	25⅛	25⅛	
29⅞	20¼	WisPL	2.32	9.0	7	38	26	25⅞	25⅞	+¼
25¼	18⅞	WisPS	2.12	9.0	8	47	23⅞	23⅜	23⅞	
36¼	20⅞	Witco	1.80	5.5	10	75	33⅛	32½	32½	-⅛
25⅛	11⅛	WolvrW	.48	1.9	13	685	25⅛	24⅞	25⅛	+1⅛
35	18⅛	Wornst	s.44	1.4	20	164	31⅛	30½	30⅞	+⅛
25⅛	16⅛	WoodPt	.60	2.8	12	357	23⅛	23	23	
34⅞	15¼	Wolwth	1.80	5.1		3560	u35	34⅛	35	+1⅛
49	23¼	Wolwr	pf2.20	4.5		7	u49⅜	48	49	+2⅝
5⅞	1⅞	WrldAr				32	4⅜	4⅛	4⅛	
47	29¼	Wrigly	1.44e	3.2	10	38	45⅞	45	45	-½
15⅞	4½	WyleLb				165	13⅛	12⅞	13⅛	
13¼	7⅞	Wyly			38	89	12⅞	12¼	12½	+⅛
18½	11⅞	Wynns	.60	3.5		59	17	16½	16⅞	+⅛
X—Y—Z										
45	27⅛	Xerox	3	7.3	9	1700	41⅛	40⅞	41	+⅛
51¼	46⅞	Xerox	pf5.45	11.		209	51	50⅞	51	
25	10⅞	XTRA		2.5	28	161	u25⅞	24⅞	25⅜	+⅜
25¼	17⅞	ZaleCp	1.26	5.1	34	180	24⅞	24⅛	24⅛	+⅛
27⅞	11⅞	Zapata	.84	5.3	3	817	15⅞	15⅛	15⅞	+⅛
80	29⅞	Zayre	.50	.6	17	284	u80¼	79⅜	80	
18⅞	8¼	ZenithR				568	18⅞	18½	18⅞	+⅛
33½	13⅛	Zero	s.48	1.5	19	11	31⅛	30⅞	30⅞	-⅛
35¼	18⅛	Zurnin	1.32	4.2	8	81	31⅞	31½	31½	-⅛

Redemption Notice

City of Oslo (Norway)

9% Sinking Fund External Loan Bonds due May 1, 1985

NOTICE IS HEREBY GIVEN, pursuant to Fiscal Agency Agreement dated as of May 1, 1970 under which the above described Bonds were issued, that Citibank, N.A., Fiscal Agent, has selected by lot for redemption on May 1, 1983 through the operation of the Sinking Fund, $1,617,000 principal amount of said Bonds at the Sinking Fund redemption price of 100% of the principal amount thereof, together with accrued interest to the date fixed for redemption. The serial numbers of the Bonds selected by lot for redemption are as follows:

M2	1319	2282	3855	4913	6814	8411	9578	10812	11918	12190	12948	13894	14510	15322	16093	16732
7	1353	2295	3895	4925	6855	8513	9584	10829	11926	12197	12955	13909	14513	15329	16102	16739
88	1365	2302	3900	4960	6898	8730	9590	10836	11986	12208	12959	13909	14516	15335	16111	16744
96	1371	2314	3916	5152	6953	8756	9607	10857	11989	12208	12965	13715	14519	15339	16115	16748
107	1376	2322	3921	5169	6915	8761	9613	10844	11948	12219	12971	13723	14523	15348	16120	16751
112	1409	2323	3927	5173	6921	8764	9625	10852	11947	12224	12976	13729	14526	15354	16123	16755
118	1407	2353	3968	5177	6976	8769	9631	10865	11960	12230	12988	13733	14529	15358	16130	16775
121	1442	2360	3939	5185	6979	8772	9637	10871	11950	12237	12991	13740	14532	15362	16137	16781
129	1465	2379	3966	5191	6983	8778	9645	10882	11965	12242	12999	13749	14538	15365	16144	16787
253	1468	2382	3978	5200	6986	8786	9652	10889	11977	12248	13007	13752	14541	15368	16152	16791
260	1476	2430	3982	5216	6990	8794	9654	10893	11981	12253	13014	13760	14544	15383	16155	16794
286	1479	2436	3986	5225	7002	8804	9671	10906	11984	12271	13021	13769	14548	15387	16158	16797
304	1484	2443	3419	5284	7029	8808	9675	10914	11989	12275	13037	13774	14552	15390	16163	16803
379	1495	2447	3424	5349	7029	8816	9690	10922	11996	12279	13037	13777	14556	15394	16170	16809
386	1514	2460	3434	5365	7052	8821	9697	10929	11999	12283	13046	13780	14559	15396	16194	16812
390	1521	2483	3436	5369	7059	8825	9706	10935	11402	12291	13058	13784	14562	15401	16198	16815
394	1562	2486	3493	5388	7063	8829	9710	10941	11407	12297	13057	13787	14565	15414	16208	16810
397	1584	2471	3708	5404	7068	8832	9714	10958	11420	12303	13061	13793	14577	15417	16210	16824
408	1587	2481	3717	5404	7082	8835	9726	10961	11426	12323	13065	13798	14586	15421	16219	16833
417	1598	2489	3762	5514	7105	8865	9733	10968	11431	12326	13072	13802	14592	15423	16224	16836
427	1598	2514	3753	5539	7138	8868	9757	10975	11440	12332	13078	13810	14595	15432	16228	16841
434	1599	2517	3759	5551	7144	8875	9763	10983	11457	12363	13091	13820	14612	15435	16231	16847
461	1603	2534	3763	5565	7157	8880	9767	10990	11461	12375	13100	13823	14621	15439	16236	16850
481	1607	2555	3766	5561	7177	8910	9775	10999	11477	12388	13103	13825	14630	15443	16242	16856
496	1613	2613	3783	5564	7183	8919	9786	10994	11487	12397	13112	13833	14630	15447	16245	16864
502	1616	2615	3818	5570	7198	8922	9794	10999	11493	12406	13120	13911	14641	15459	16250	16868
508	1622	2622	3829	5577	7243	8927	9808	10930	11519	12410	13129	13917	14648	15465	16253	16871
613	1625	2632	3843	5646	7232	8933	9825	10929	11523	12415	13134	13924	14658	15470	16259	16876
610	1628	2654	3854	5693	7277	8938	9836	10938	11531	12425	13148	13934	14665	15477	16262	16883
619	1632	2657	3864	5697	7308	8948	9853	10952	11544	12434	13151	13941	14679	15480	16276	16887
645	1636	2665	3871	5615	7349	8965	9857	10960	11547	12445	13159	13949	14683	15486	16281	16890
651	1641	2672	3881	5672	7363	8968	9863	10962	11551	12456	13167	13959	14704	15490	16322	16895
501	1644	2694	3888	5687	7369	8972	9865	10966	11552	12466	13172	13968	14709	15496	16328	16905
664	1651	2698	3898	5706	7387	8974	9900	10973	11579	12473	13185	13972	14717	15502	16333	16909
664	1654	2705	3902	5707	7387	8982	9907	10980	11588	12479	13191	13982	14724	15507	16338	16905
607	1656	2715	3906	5738	7401	9054	9919	10987	11594	12486	13196	13988	14734	15513	16357	16919
613	1661	2719	3909	5727	7515	9071	9914	10995	11601	12496	13203	13996	14741	15517	16361	16916
648	1664	2726	3904	5730	7538	9090	9919	10603	11624	12499	13211	14004	14748	15521	16365	16920
654	1668	2734	3907	5732	7622	9114	9922	10621	11634	12504	13218	14011	14757	15525	16370	16928
657	1671	2737	3911	5735	7632	9147	9925	10632	11634	12512	13406	14017	14763	15530	16376	16932
661	1674	2740	3918	5802	7675	9153	9929	10640	11641	12519	13419	14024	14770	15539	16380	16936
664	1797	2744	3922	5808	7701	9158	9932	10649	11644	12524	13419	14034	14774	15548	16387	16942
668	1705	2748	3949	5891	7705	9163	9935	10646	11650	12529	13425	14035	14781	15556	16392	16946
725	1709	2759	3958	5948	7719	9166	9938	10674	11662	12535	13434	14036	14792	15561	16396	16949
734	1771	2762	3965	5963	7720	9171	9943	10682	11669	12541	13442	14045	14798	15566	16403	16952
737	1777	2763	3968	5975	7727	9176	9946	10688	11627	12547	13449	14046	14807	15575	16412	16957
749	1781	2772	3973	6005	7729	9194	9951	10694	11631	12564	13457	14056	14815	15580	16418	16984
782	1786	2779	4012	6117	7786	9218	9957	10701	11633	12562	13467	14062	14822	15593	16424	16968
789	1800	2787	4034	6122	7842	9230	9962	10706	11634	12569	13470	14105	14830	15602	16430	16975
791	1805	2803	4037	6126	7851	9236	9966	10717	11636	12575	13473	14116	14837	15610	16435	16982
802	1837	2806	4041	6152	7866	9239	9969	10725	11642	12580	13477	14122	14842	15619	16438	16989
807	1834	2830	4045	6162	7870	9246	9975	10731	11645	12587	13482	14124	14849	15629	16442	16993
816	1845	2841	4074	6174	7878	9250	9979	10738	11649	12590	13485	14134	14856	15636	16445	16998
881	1862	2815	4207	6178	7885	9257	9980	10946	11681	12597	13489	14143	14862	15639	16449	17002
938	1912	2818	4213	6182	7889	9261	9982	10954	11686	12603	13515	14146	14870	15643	16457	17012
941	1924	2824	4303	6196	7896	9267	9998	10961	11916	12612	13518	14150	14884	15647	16464	17025
948	1930	2838	4321	6199	7901	9274	9998	10978	11915	12619	13522	14157	14888	15650	16472	17031
949	1941	2851	4326	6193	7954	9279	10001	10983	11930	12628	13529	14158	14895	15654	16490	17043
968	1945	2855	4349	6196	7957	9288	10011	11005	11932	12632	13532	14164	14901	15657	16496	17046
992	1950	2863	4409	6254	8028	9294	10017	11013	11938	12642	13536	14178	14909	15661	16515	17049
999	1960	2873	4428	6258	8035	9312	10026	11024	11952	12635	13538	14190	14910	13792	16523	17063
1008	1964	2876	4473	6262	8038	9324	10035	11065	11955	12641	13547	14194	14922	15735	16529	17065
1012	1967	2904	4474	6266	8042	9331	10042	11069	11960	12651	13554	14198	14929	15741	16531	17068
1014	1974	2907	4495	6289	8060	9338	10048	11083	11983	12660	13558	14213	14936	15745	16535	17074
1018	1987	2917	4512	6272	8056	9345	10056	11113	11988	12674	13564	14220	14942	15748	16546	17078
1040	1993	2940	4533	6278	9194	9354	10066	11123	11974	12682	13568	14261	14954	15751	16558	17087
1072	1997	2956	4537	6282	8198	9359	10073	11127	12002	12701	13572	14266	14963	15754	16564	17095
1077	2007	2962	4547	6301	8201	9372	10078	11130	12009	12706	13578	14291	14969	15760	16578	17112
1083	2016	2971	4593	6306	8206	9379	10083	11133	12016	12720	13579	14311	14974	15767	16586	17119
1089	2020	2976	4619	6311	8207	9384	10088	11136	12025	12727	13583	14320	14982	15773	16597	17127
1097	2063	2980	4611	6315	8210	9388	10093	11170	12031	12739	13584	14329	14993	15770	16608	17130
1099	2107	2987	4614	6321	8214	9393	10102	11178	12043	12750	13591	14337	15002	15783	16615	17133
1108	2111	3008	4636	6325	8217	9401	10104	11188	12047	12766	13595	14349	15008	15791	16620	17140
1119	2129	3077	4641	6328	8281	9407	10785	11191	12062	12777	13599	14358	15016	15798	16623	17143
1126	2140	3086	4657	6331	8341	9415	10169	11195	12077	12783	13608	14365	15023	15802	16628	17146
1133	2145	3091	4705	6336	8319	9421	10174	11200	12084	12804	13606	14374	15030	15802	16631	17156
1136	2150	3115	4716	6339	8319	9428	10189	11204	12091	12809	13611	14381	15036	15808	16636	17164
1140	2153	3118	4735	6342	8322	9434	10191	11209	12102	12819	13617	14389	15040	15812	16640	17168
1147	2157	3121	4729	6348	8328	9441	10197	11214	12109	12825	13621	14401	15043	15818	16644	17173
1152	2161	3127	4741	6354	8331	9450	10202	11217	12114	12832	13624	14415	15049	15826	16649	17184
1169	2165	3130	4758	6358	8335	9456	10207	11221	12123	12838	13629	14423	15054	15833	16654	17190
1193	2171	3133	4767	6405	8340	9470	10212	11224	12127	12846	13632	14429	15057	15840	16658	
1210	2174	3146	4770	6409	8343	9475	10217	11227	12132	12854	13639	14433	15061	15853	16664	
1226	2178	3150	4771	6423	8348	9485	10221	11232	12135	12861	13643	14439	15070	15859	16667	
1233	2181	3157	4776	6432	8366	9491	10224	11235	12139	12865	13646	14442	15076	15866	16671	
1238	2184	3176	4779	6475	8368	9499	10227	11239	12142	12871	13649	14449	15082	15873	16674	
1261	2187	3180	4780	6481	8377	9502	10230	11243	12146	12875	13654	14451	15091	15880	16678	
1267	2190	3184	4782	6487	8381	9511	10235	11247	12149	12884	13657	14454	15097	15885	16684	
1270	2194	3206	4786	6493	8389	9519	10244	11252	12153	12888	13661	14458	15104	15892	16689	
1274	2198	3225	4790	6501	8544	9525	10252	11257	12156	12890	13664	14466	15111	16000	16694	
1278	2203	3231	4803	6504	8550	9534	10272	11263	12161	12906	13667	14477	15118	16030	16701	
1291	2210	3236	4833	6516	8552	9542	10279	11271	12167	12912	13671	14481	15122	16036	16707	
1299	2225	3238	4839	6516	8556	9546	10284	11289	12170	12921	13674	14491	15126	16042	16710	
1312	2253	3242	4860	6529	8575	9554	10290	11296	12173	12929	13678	14496	15311	16050	16719	
1314	2257	3245	4863	6706	8586	9562	10299	11303	12178	12936	13683	14501	15314	16056	16724	
1315	2278	3290	4906	6770	8604	9570	10307	11308	12181	12942	13688	14506	15319	16063	16729	

On May 1, 1983 there will become due and payable upon each Bond selected for redemption the said redemption price, together with interest accrued to the date fixed for redemption. Payment of the redemption price of the Bonds to be redeemed will be made in such coin or currency of the United States of America as at the time of payment is legal tender for the payment of public and private debts thereon, upon presentation and surrender of said Bonds, with all coupons appertaining thereto maturing after the date fixed for redemption, at the Corporate Trust Office of Citibank, N.A., Municipal Bond Processing Window, 20 Exchange Place, 16th Floor, New York, N.Y. 10043 and subject to applicable laws and regulations, at the main offices of Citibank, N.A., in Amsterdam, Brussels, Frankfurt (Main), London, Milan and Paris. Payment at the offices of Citibank, N.A. in Europe referred to above will be made by check drawn upon a bank in New York City or by a transfer to a dollar account maintained by the payee with a bank in New York City.

On and after the date fixed for redemption interest on said Bonds will cease to accrue. Coupons due May 1, 1983 should be detached from the Bonds and presented for payment in the usual manner.

For the CITY OF OSLO (NORWAY)
CITIBANK, N.A.
as Fiscal Agent

March 31, 1983

The Laird Group

PUBLIC LIMITED COMPANY

Results 1982

	Year to 31 December 1982 £'000	Year to 27 December 1981 £'000
Turnover	305,340	272,200
Profit before Tax	19,103	18,479
Tax	(5,978)	(3,964)
Profit after Tax	13,125	12,515
Extraordinary items	(290)	(782)
	12,835	11,733
Dividends	(3,297)	(2,827)
Retained Profit for the year	9,538	8,906
Earnings per Ordinary Stock Unit	16.7p	18.5p
Net dividend per Ordinary Stock Unit	4.2p	4.0p
Dividend cover	4.0	4.6
Net assets per Ordinary Stock Unit	103.4p	84.1p

Notes

1. A final dividend of 2.1p net is recommended making a total for the year of 4.2p net (1981: 4.0p).

2. The tax charge includes overseas tax of £2.5m. (1981: £2.3m.).

3. An overvaluation by a subsidiary of stocks and work in progress in 1981 and earlier years has been corrected by reducing the Group profit for 1981 by £367,000 and by writing off £855,000 against revenue reserves for earlier years.

4. The Board has adopted a revised accounting policy for goodwill and as a result the total goodwill of £25.2m. shown in the 1981 Group accounts has been written off against revenue reserves. The underlying values of Group businesses remain unaffected.

5. The current cost profit after tax is £10.6m. and the current cost earnings per Ordinary Stock Unit are 13.5p.

APPOINTMENTS

Changes at Planned Savings

Mr Michael Fletcher has been appointed managing director of PLANNED SAVINGS GROUP, financial services subsidiary of Dominion International Group. He was formerly the group's administration director and succeeds Mr Richard Williams who was seconded to Planned Savings and now resumes group financial responsibilities. Mr Phil Pearce becomes group chief accountant of Dominion International in succession to Mr Richard Trew, who has resigned. Mr Pearce was formerly chief accountant of the group's property division. Mr Roger Horton has been made managing director of the housing division in succession to Mr Derek Brooks, a director of Dominion, who relinquishes his responsibility for housebuilding to concentrate on commercial development and investment activities of the group's property division. Mr Horton was previously marketing director of Wates Built Homes.

★

Mr M. Rowe has been admitted into partnership with WOOD MACKENZIE AND CO. stockbrokers, Edinburgh.

★

WILLIAM COLLINS has appointed Mr Mark Collins as a vice-chairman. Mr David Nickson has resigned as a vice-chairman in view of his many other commitments but remains a director. Mr Collins will succeed Mr Ian Chapman as chairman of Hatchards and will have full responsibility for it, working closely with Mr Tommy Joy, the present managing director. Mr Collins has relinquished his present appointment as managing director of Collins Publishers.

★

Mr Brian Ford, president of Bunzl Corp, BUNZL'S wholly-owned U.S. subsidiary, has been appointed to the board of Bunzl plc. Mr Robert McGough has been appointed chief financial officer of Bunzl Corp.

★

Mr Brian Manley, managing director of MEL, the Philips UK defence and avionics company, and managing director of the Philips Business Systems Group, has been appointed to the board of PHILIPS ELECTRONICS AND ASSOCIATED INDUSTRIES from May 1. He will, in addition to his direct responsibility for MEL and Philips Business Systems, assume board responsibility for Pye Telecommunications and the Philips Research Laboratories at Redhill.

★

Mr Abel Hadden has been appointed a director of GOOD RELATIONS GROUP and chief executive of Good Relations, consumer public relations subsidiary.

★

Mr Dick M. Hosie has been appointed to the board of the Ardrox Division of BRENT CHEMICALS INTERNATIONAL as financial director.

★

T L MOTOR POLICIES at Lloyd's has appointed Mr Barry Fogden as claims manager to the syndicate.

★

Mr Daniel Lefort has been appointed to the board of HOOVER. Mr Lefort, a French citizen, is the general manager of SA Hoover, France. Mr Ron Beehy, home sales manager (UK), and Mr Guy Spurling, marketing executive (Continental Europe), are appointed associate directors of the company.

★

Mr Albert Bocking has been appointed managing director of WORTHINGTON-SIMPSON, following the retirement of Mr J. H. Page. Mr Bocking was previously general manager of the pumps division, owned jointly by Worthington division, McGraw-Edison, U.S., and the Weir Group, Scotland.

★

DMA, the company that recently purchased Superbreak Holidays from British Transport Hotels, has appointed Mr Richard Dunn as a non-executive director. He is a senior partner in the legal firm of Fox and Gibbons and also holds a number of directorships in the hotel industry.

WEEK'S FINANCIAL DIARY

The following is a record of the principal business and financial engagements during the week. The board meetings are mainly for the purpose of considering dividends and official indications are not always available whether dividends concerned are interims or finals. The sub-divisions shown below are based mainly on last year's timetable.

TODAY

COMPANY MEETINGS—
Aerostructure Inv Tst, 120, Cheapside EC, 12.15
Yorkgreen Invs, Cafe Royal, 68, Regent Street, W, 10.15
BOARD MEETINGS—
Finals:
Anchor Chemical
Barton Grp
Edinburgh Secs
Jersey Elec
Joanna Most Houses
Rugby Portland Cement
Interims:
Bryant
Hall
Halstead (James)
Highland Dist
Pineapple Dance Studios
PSW—Television South West
Saack (W. A.)
DIVIDEND & INTEREST PAYMENTS—
Clark (Matthew) and Sons (Hldgs) 2p
English China Clays 5.2p
Geiler (A. and J.) 1.0p
Grand Metropolitan 4.975p
Hamilton Oil Great Britain 1p
Islington Corp 12.98pc Red 3007 £6.325
Jackson (J. and H.) 0.9p
Kershaw (A.) and Sons 5p
Manchester Ship Canal Co 3.5p
Do. Spc Perp Prf 3.5p
Megit CA 7p cts
Rank Organisation 3.2p
Scottish Eastern Inv Tst 6½pc Red Deb 1985-90 3½pc
Telefusion 0.82p
Do A NV 0.82p

TOMORROW

COMPANY MEETINGS—
Alecom Intnl, Royal Society of Arts, 8, John Adam Street, Adelphi, WC, 10.30
General Funds Inv Tst, Regis House, King William Street, EC, 12.15
Robinson Bros (Hyderd Green), Stone Manor Hotel, Kidderminster, 12.15
BOARD MEETINGS—
Finals:
Air Call
Bowthorpe
Brook St Bureau
Ergomet Intnl
Johnston
Lamont
Nthrn Eng Inds
Quick (H. and J.) Grp
Solex
Interims:
Bmess Lionking
Scottish Cities Inv Tst
Smiths Inds
DIVIDEND & INTEREST PAYMENTS—
Amana Group 3p
Kuala Lumpur Kepong Berhad 7.5 sen
Warnford Invs 5.5p
Webb (Joseph) 0.7313p

WEDNESDAY APRIL 13

COMPANY MEETINGS—
Bank Leumi (UK), 4-7, Woodstock Street, W, 2.30
Greenwich Cable Communications, Clarendon Hotel, Montpelier Row, Blackheath, SE, 11.00
Provident Financial Group, Norfolk Gardens Hotel, Hall Ings, Bradford, West Yorkshire, 12.00
West Coast and Texas Regional Inv Tst, 97, Lombard Street, EC, 3.00
BOARD MEETINGS—
Finals:
Astbury and Madeley
Bolton Mohair Spinners
Durman Grp
Downtrix (I. J.)
Empire Stores (Bradford)
Finlay (John)
Gill and Duffus
Hewden-Stuart Plant
Higgs and Hill
Huntleigh
Oil and Gas Prod
Oilfield Inspection Services
Pearl Assurance
Rechapete
Royal Worcester
Spencer (George)
Wilson Connolly
Interims:
Kalamazoo
DIVIDEND & INTEREST PAYMENTS—
Berry Pacific Fund 3.5 cts
Citicorp Overseas Finance Corp NV Gtd Fltg Rate Notes 1982 $217.19
General Funds Inv Tst 3.75p
Motorola Inc 40 cts
Robeco NV Fl 13
Sc Sub (Reg Not Prov Bank) Fl 1.5
Do Sub (Reg In Other Names) Fl 1.5
Stakis 1.26p

THURSDAY APRIL 14

COMPANY MEETINGS—
Adams and Gibson, County Hotel, Newcastle-Upon-Tyne, 11.00
Anglo American Securities 23, Great Winchester Street, EC, 2.45
Blagdon Inds, Connaught Rooms, Great Queen Street, WC, 12.00
C.S.C. Inv Tst, 44, Bloomsbury Square, WC, 12.30
Lovell (G. F.), King's Head Hotel, Newport Gwent, 12.00
Rea Bros, Grand Eastern Hotel, Liverpool Street, EC, 13.00
Scan Data Intnl, Chaucbury House, Church Street, Storrington, West Sussex, 13.00
Yeates (W. S.), Quorn Country Club, Quorn, Leicestershire 12.00
BOARD MEETINGS—
Finals:
Ash and Lacy
Assd British Ports
Beauford
Brown Boveri Kent
Gen Investors and Trustees
Green's Economiser
Harrison (T. C.)
Hestair
House Property London
London Bricks
Norton (Albert)
Morgan Crucible
Newarthill
Portals
Reed (Austin)
Rio Tinto-Zinc
Taylor Woodrow
Utd Ceramic Distributors
Interims:
Dowding and Mills
Kent (M. P.)
Low (William)
Martonair Intnl
New Cent Witwatersrand Areas
Pete Stores
DIVIDEND & INTEREST PAYMENTS—
Bank Leumi (UK) 7p
Credit Europe Bank BV Gtd Fltg Rate Notes 1991 £267
English and New York Tst 2.5p
Imasco Platinum Hldgs 23 cts
Jenkins Drilling 19.5p
National Westminster Bank Fltg Rate Cap Notes 1994 $63.08
RGC Intnl Capital Fund Ptg Red Prf 5 cts
Rea Brothers 0.8p
St Andrews Tst 4.2p
Stenhouse Hldgs 3.5p
United Real Property Tst 1.5p
West Coast and Texas Regional Inv Tst 1.45p

FRIDAY APRIL 15

COMPANY MEETINGS—
Almeund Group, Almeund Jubilee Club, Capel Road, Trowbridge, Wiltshire, 12.30
Alliance Tst, Meadow House, 64, Reform Street, Dundee, 11.30
West Hampshire Water Co, Knapp Mill Mill Road, Christchurch, Dorset, 3.00
BOARD MEETINGS—
Finals:
Blackwood Hodge
Dewhurst Dent
Hasting Petroleum Services
Leyland Paint and Wallpaper
Miller (F.) (Textiles)
Interims:
Advest
L Wand Inv
Ulster TV
DIVIDEND & INTEREST PAYMENTS—
Alcoa of Australia 13½pc Bds 1991 6½pc
Allied Irish Banks Fltg Rate Notes 1992 $537.15
American Medical Intnl NV 8½pc Sub Gtd Cov Bds 1992 2½pc
Amstrad Consumer Electronics 1.12p
Anglo American Securities Corp 3.6p
Arantagasta Hldgs 7p
Arbuthnot Govt Secs 7st Inc Ptg Red Prf 3.75p
Baico Nac De Obras Y Serv Pub SA 17½pc Bonds 1992 8½pc
Barclays Bank Intnl 9½pc Cap Bds 1987 4½pc
Bell Canada 52 cts
British American and Gen Tst 1.6p
Campbell Soup Overseas Finance NV 14pc Gtd Notes 1989 7pc
Canada Spc Bds 18-1083 4½pc
Cheshire Pacific Securities 16½pc Gtd Notes 1989 9½pc
City of Aberdeen Land Assoc 4.38p
Copenhagen (City of) 9½pc 29 yr 8th Century 1967 3½pc
Crest Nicholson 1.9p
Debenhams 5½pc 2nd Deb 1979-83 2½pc
Die Erste Osterreich Spar-Casse Sub Fltg Rate Notes 1992 $540.31
Emi Finance BV 6½pc Gtd Bds 1980 4½pc
Elder 0.588p
Eldridge, Pope and Co 6½pc Irrd Ln Stks
Do. 7½pc Irrd Ln 3½pc
Ericsson (L. M.) (Telefonaktiebolaget) 8½pc Bds 1989 4½pc
Goode Durrant and Murray Group 3.5pc Prf 0.875p
Gulf States Overseas Finance NV 16pc Gtd Deb 1990 8pc
Habitat Mothercare 8½pc Cnv Ln 1998/2001 4½pc
Hiram Walker Hldgs NV 14½pc Gtd Debs 1009 7½pc
Inchcape 1Bermodal 9½pc Cnv Gtd Bds 1992 3½pc
Isle of Man Govt 3½pc 1953/83 1½pc
McLeod Russel 9.4pc Cnv Red Prf 4.2pc
Mandex 1Hldgs) 9pc Prf 1.79p
Manitoba (Province of) 8½pc Debs 1983 4½pc
Mediamaster 1.6p
Merton (London Borough of) 11½pc Rnd 2017 £1,9329
Metropolitan Water Southwark and Vauxhall Water Co 3pc Deb 1½pc
Metropolitan Water Wst Middlesex Water Works Co 3pc Deb 1½pc
Morgan (J. P.) and Co. Inc 02.5 cts
Newcastle-Upon-Tyne Corp 6½pc Cons Red 1901/83 4½pc
Norway 19½pc Deb 1990/95 7½pc
North British Props 9½pc Cnv Ln 1996 4½pc
Occidental Petroleum Corp 62.5 cts
Oppenman (Hldgs) 7½pc Deb 1987/92 7½pc
Paterson Jenks 11.5pc Cnv Prf 8.79p
Philippines 1Republic of) 9pc Notes 1988 4½pc
Privatbanken AS 14½pc Sub Notes 1988 7½pc
Quaker Oats Co 50 cts
Ramprge 13pc 1Nwl Cnv Red Prf (1991-1992) 9.5p
Ricardo Consulting Engineers 3.5p
Richards 4pc Prf 1.4p
Rio 8½pc Prf 1.44375p
Sandvik Aktiebolag 9½pc Bds 1999 $95
Schlumberger 24 cts
Scottish Agric Sec Corp 7pc Deb 1980/83 3½pc
Sea Containers Prf 93.8 cts
Siemens Finanzierungsmatschappij NV 15½pc £5 Optns 1989 7½pc
Tokay Inds Inc 7½pc Gtd Notes 1984 3½pc
Toronto Dominion Bank 14pc Deb Notes 15,484 7½pc
Transco Intnl NV 15½pc Gtd Notes 1007 (With Warrants) 7½pc
Do. 19½pc Gtd Notes 1987 (Without Warrants) 7½pc
Treasury Spc 1985/89 1Reg) 2½pc
Trust Houses Group Fin NV 7½pc Bds 3½pc
Turin 1City of) 9½pc £/DM Bds 1984 3½pc
Unisec Group 22 cts
Volvo AB 9½pc Bds 1984/85 4½pc
Warner Estates Hldgs 19½pc Prf 3.375p
Watson Mann and Truman Hldgs 6pc Red Deb 1998/94 7pc
Whitbread and Co 10½pc £/FC Bds 1990 5½pc
Zimbabwe 1Govt of) Sett Term Ann 1901/09 ££100 per annum1 £59

SATURDAY APRIL 16

DIVIDEND & INTEREST PAYMENTS—
Swansea (City of) 13½pc Red 2009 9½pc

FT LONDON SHARE INFORMATION SERVICE

BRITISH FUNDS

Interest Due	Stock	Price £	Last xd	Yield Int.	Yield Red.
"Shorts" (Lives up to Five Years)					
18Ja 18Jul	Treasury 9¼pc '83	99½	13.12	9.27	9.89
22May 22N	Exch 13½pc '83	101½	18.10	13.26	10.30
12Jun 12D	Exch 10pc 1983	99½	5.11	10.02	10.20
15Jul 15Ja	Funding 5½pc '82-84‡‡	97	9.12	5.67	9.61
20Aug 20F	Exch 11¼pc 1984	100⅞	14.1	11.15	10.13
22N 22May	Exchequer 14pc 1984	103¼	18.10	13.54	10.78
19D 19Jun	Exch. 3pc 1984	94⅝	12.11	3.17	7.80
26Mar 26S	Treasury 12pc 1984	102	17.2	11.76	10.39
22Aug 22F	Treasury 15pc 1985	106½	17.1	14.03	10.76
22S 22Mar	Exch. 12pc Cnv. '85	104¾	14.2	11.46	9.25
21N 21My	Treasury 3pc 1985	90	15.10	3.33	8.26
15Jan 15Jul	Treasury 11½pc 1985	101⅛	9.12	11.37	10.91
3 Sept	Treas 8¾pc Cnv '85	97¼	—	9.00	10.02
22May 22N	Exch. 12¼pc 1985	102½	18.10	11.95	11.10
25 Aug 25F	Exch. 11¾pc '86	101⅞	19.1	11.53	10.95
19N 19May	Treasury 3pc 1986	86	13.10	3.49	8.20
19 Nov —	Exch. 10½pc Cv '86 (£25pd)	26½	—	10.43	10.22
12D 12Jun	Treasury 12pc '86	102½	5.11	11.71	11.02
10Ja 10Jul	Treasury 8½pc '84-86‡‡	95⅛	6.12	8.91	10.20
14Ja 14Jn	Treas 12¾pc '86 Cnv.	110½	8.12	11.09	8.50
29Apr 29Oct	Exch. 14pc 1986	108¼xd	23.3	12.91	11.07
22Jul 22Jan	Exch. 13¼pc 1987	106½	16.12	12.44	11.07
—	Exchequer 2½pc 1987	82⅝	—	3.03	7.77
Oct 6 Apr 6	Exch. 10½pc 1987	98⅞	1.3	10.62	10.84
6 Oct —	Exch. 10½pc 1987A	98¼	—	10.63	10.88
1N 1May	Funding 6½pc '85-87‡‡	89¼xd	25.3	7.24	9.61
14Ja 14Jul	Treasury 3pc 1987	81½	8.12	3.68	8.24
3 May 3N	Treas. 12pc 1987	103¾xd	28.3	11.61	11.04
26Jul 26Ja	Treasury 7¾pc '85-88‡‡	90½	20.12	8.58	10.33
Five to Fifteen Years					
—	Exch 10½pc '88	97¼xd	5.4	10.72	11.04
1Ja 1Jul	Transport 3pc '78-88	80½	25.11	3.77	7.01
25Ap 25Oct	Treas. 9½pc '88	93⅝xd	21.3	10.13	10.98
22Aug 22F	Treasury 11½pc 1989	102	17.1	11.44	11.37
14Dec —	Treas 10½pc '89 (£25pd)	E96	—	10.94	11.41
13Ap 15Oct	Treasury 5pc '86-89	78¼xd	9.3	6.39	9.55
15Jul 15Ja	Treasury 13pc 1990‡‡	110¼	9.12	12.13	11.43
22Sept 22Mar	Exch. 12½pc 1990	105½	14.2	11.93	11.46
13D 15Jun	Treasury 8¼pc '87-90‡‡	90½	8.11	9.39	10.71
10Jul 10Ja	Treasury 11¾pc 1991	104¾	6.12	11.60	11.47
5Oct 5Ap	Funding 5¾pc '87-91‡‡	77	1.3	7.48	10.02
25Ap 25Oct	Exch. 11pc 1991	98½xd	21.3	11.16	11.27
22Jul 22Ja	Treasury 12¾pc '92‡‡	110½	16.12	11.83	11.32
21Aug 21Fb	Treasury 10pc 1992	96⅛	17.1	10.55	10.93
25Fb 25Aug	Exch. 12¼pc '92	106⅛	19.1	11.68	11.39
22Mar 22S	Exchequer 13½pc '92	113⅞	14.2	12.13	11.52
14Ja 14Jul	Treasury 12½pc '93‡‡	110	8.12	11.68	11.32
13Mar 15S	Funding 6pc 1993‡‡	73¾	7.2	8.07	10.02
23May 23N	Treasury 13¾pc 1993‡‡	119⅝	18.10	12.02	11.37
1S 1 Mar	Treasury 14½pc '94‡‡	120¼	24.1	12.17	11.38
27O 27Ap	Exchequer 13½pc 1994	112¼xd	21.3	11.96	11.42
22F 22Aug	Exch. 12½pc 1994	108⅞	17.1	11.66	11.35
17May 17N	Treasury 9pc '94‡‡	94⅞	11.10	9.94	10.42
25Jul 25Ja	Treasury 12pc '95	107¼	20.12	11.46	11.25
1N 1May	Gas 3pc '90-'95	62¾xd	25.3	4.77	7.80
21Ja 21Jul	Exch. 10¼pc 1995	97⅝	15.12	10.75	10.94
13May 15N	Treasury 12¾pc '95‡‡	110xd	11.10	11.47	11.08
22Jul 22Ja	Treas. 14pc '96	121⅛	16.12	11.85	11.28
15S 15Mar	Treasury 9pc '92-96‡‡	90⅝	7.2	10.00	11.42
3N 3May	Treasury 15¼pc '96‡‡	126½xd	28.3	11.97	11.21
15N 15May	Exchequer 13¼pc '96‡‡	114½xd	11.10	11.45	10.96
1Ap 1Oct	Redemption 3pc 1986-96	59¾	23.2	5.03	7.92
22Jul 22Ja	Treasury 13¼pc '97‡‡	118⅜	16.12	11.47	11.02
21Aug 21F	Exchequer 10½pc 1997	100	17.1	10.65	10.69
1Mar 1S	Treasury 8¾pc 1997‡‡	88¼	24.1	9.97	10.40
27Ap 27Oct	Exch 15pc 1997	126¼xd	21.3	11.82	11.21
Over Fifteen Years					
1N 1May	Treasury 6¾pc '95-98‡‡	75xd	25.3	8.96	9.94
30Mar 30S	Treas. 15½pc '98‡‡	132¼	21.2	11.77	11.14
20May 20N	Exch. 12pc 1998	112⅞	14.10	11.89	10.89
15Jul 15Ja	Treasury 9½pc 1999‡‡	95	9.12	10.24	10.44
26S 26Mar	Exch. 12¼pc 1999	110⅞	17.2	11.10	10.87
19N 19May	Treasury 10½pc 1999	103¼	13.10	10.59	11.10
14Ja 14Jul	Treas. 13pc 2000	139⅝	8.12	11.16	10.86
22N 22May	Treas. 14pc '98-01	127⅛	18.10	11.50	11.01
22Jul 22Ja	Exch. 12pc '99-02	112⅜	16.12	10.93	10.70
25Ja 25Jul	Treas. 13¾pc 2000-03	124¾	20.12	11.28	10.91
19S 19Mar	Treasury 11½pc '01-04	109	10.2	10.62	10.46
14Ja 14Jul	Funding 3½pc '99-04	47¼	8.12	7.46	9.25
21May 21N	Treasury 12½pc '03-05	120¼	15.10	10.83	10.64
3Ap 5Oct	Treasury 8pc '02-06‡‡	82⅜	1.3	9.73	9.97
22Jul 22Ja	Treasury 11¾pc 03-07	112⅜	16.12	10.70	10.52
26S 26Mar	Treas. 13½pc '04-08	123⅝	17.2	10.97	10.71
10Mar 10S	Treasury 5½pc '08-12‡‡	61	1.2	9.09	9.51
26Jul 26Ja	Treasury 7¾pc '12-15‡‡	81½	20.12	9.70	9.82
12 Jun 12D	Exch. 12pc '13-'17	120	5.11	10.34	10.26
Undated					
1F 1Aug	Consols 4pc	40	29.12	10.19	—
1Jun 1D	War Loan 3½pc‡‡	36⅞	25.10	9.83	—
1Ap 1Oct	Conv. 3½pc '61 Aft.	40¾	23.2	8.61	—
5Ap 5Oct	Treasury 3pc 66 Aft	30½	1.3	9.85	—
5Ja 5Oct	Consols 2½pc	25	1.3	10.02	—
1Ap 1Oct	Treasury 2½pc	24¾	23.2	10.13	—
Index-Linked & Variable Rate					
24N, 24 May	Treas. Variable '83	100	18.10	10.72	10.28
				(1)	(2)
30Mar 30Sept	Treas. 2pc I.L. '88	104⅛	21.2	2.02	2.36
16 Mar, 16 S.	Do. 2pc I.L. '96	110⅝	7.2	2.39	2.52
24 Mr 24 Spt	Do. 2½pc I.L. 2001	102⅞	15.2	2.35	2.44
20May 20N	Do. 2½pc I.L. 2003	103½	—	2.34	2.43
19 Ja 19 Jul	Do. 2pc I.L. 2006	107	13.12	2.32	2.41
20May 20N	Do. 2½pc I.L. 2009	104	—	2.34	2.42
23F 23Aug	Do. 2½pc I.L. 2011	108⅞	17.1	2.35	2.43
26Jul 26Jan	Do 2½pc I.L. 2016	100	—	2.35	2.41

Prospective real redemption rate on projected inflation of (1) 10% and (2) 7%

INT. BANK AND O'SEAS GOVT. STERLING ISSUES

Interest Due	Stock	Price £	Last xd	Yield Int.	Yield Red.
28Ja 28Jly	Australia 13½pc 2010	113½	29.12	11.89	12.12
23M 23S	Euro Inv Bk 11pc Ln 2002	94½	—	11.73	11.86
1N 1M	Finland 14½pc Ln 1986	106¼	4.10	13.65	12.00
—	Int-Am Dev Bk 12½pc 2003	29¼	—	12.74	12.76
31M 30C	Int. Bank 13½pc 1986	105¼xd	6.4	12.83	11.42
—	Do. 14pc Ln 1987	107½	30.9	13.02	11.57
1M 1S	Mex 16½pc 2008	83¼	1.3	20.20	22.67
29Jly 29Dec	N.Z. 14¼pc 1987	108¾	29.11	13.16	11.71
13S 15M	Sweden 13½pc 1986	104	15.9	12.98	11.80
—	Do. 13½pc Ln 2010	33¾	—	13.10	12.94

CORPORATION LOANS

Interest Due	Stock	Price £	Last xd	Yield Int.	Yield Red.
30A 31O	Bath 11¼pc 1985	100	30.9	11.25	11.23
1O 1J	Birm'ham 12½pc 1985	102½	1.11	12.19	11.11
1O 1J	Burnley 13pc 1987	104¼	29.9	12.46	11.66
24A 24O	Cardiff 11pc 1986	99¼	24.9	11.09	11.26
13F 15Ag	G.L.C. 13¼pc 1984	102¾	17.1	12.94	10.70
13F 15A	Do. 6¾pc 90-92	78	17.1	8.75	10.83
1F 1A	Herts 6¾pc 1985-87	85¼	1.11	7.90	11.12
1A 1O	Leeds 13½pc 2006	112	10.3	12.07	11.97
15N 15M	Liverpool 9¾pc '80-84	99¼	15.10	9.83	10.47
1Ja.A.J.O.	Do. 3½pc Irred.	28	1.9	12.71	—
15M 15N	Lon. Corp. 13¼pc '83	101⅝	15.10	13.02	10.64
1A 1O	Do. 9¼pc '84-85	96½	1.9	9.59	11.34
15J 15N	LCC 5½pc '82-84	93¾	15.12	5.84	10.90
1IO 1IJ	Do. 5½pc '85-87	81½	11.11	6.75	11.12
10Ja 10J	Do 6¾pc '88-90	79½	10.12	8.67	11.30
1M.J.S.D.	Do. 3pc '20 Aft.	24½	1.2	12.55	—
15J 15D	Sunderland 12¼pc 1984	101¾	10.12	12.02	11.89

COMMONWEALTH AND AFRICAN LOANS

Interest Due	Stock	Price £	Last xd	Yield Int.	Yield Red.
1J 1D	Aust. 6pc 1981-83	98⅝	29.10	6.20	11.17
1Ja 1J	N.Z. 7¼pc 1988-92	76½	1.12	9.71	11.83
15D 15J	Do. 7½pc '83-86	91	15.11	8.46	11.83
—	S. Rhod. 2½pc Non-Ass.	160	—	—	—
10Mar 10Sept	Do. 3½pc 80-85 Assd.	77	10.2	4.55	15.00
7F 7A	Do. 4½pc 87-92 Assd.	47	7.1	7.54	13.90
15O 15A	Zimbabwe Ann (£100pa)	323xd	15.3	—	20.00

LOANS

Public Board and Ind.

Interest Due	Stock	Price £	Last xd	Yield Int.	Yield Red.
1Ja 1J	Agric. Mt. 5pc '59-89	76	1.12	6.69	10.63
1M 1S	Met. Wtr. 3pc 'B'	32½	1.2	9.31	12.02

LOANS—Continued

Interest Due	Stock	Price £	Last xd	Yield Int.	Yield Red.
Financial					
20J 20D	FFI 14pc '83	102	31.5	13.67	10.22
31M 30N	FFI UK Fo 6¼pc Db '81-84	94½	1.11	6.81	12.18
11Ja 11J	Do. 10¾pc Uns.Ln. '86	100½	29.11	10.75	11.50
11Ja 11J	Do. 11pc Uns.Ln. '88	102	29.11	11.06	11.10
11Ja 11J	Do. 13¼pc Uns.Ln. '90	102	29.11	11.87	12.00
14Mr. 14S	Do. 12½pc Uns. Ln. 1992	102¾	14.3	12.25	12.10
30J 31D	Do 7¼pc A Deb '89-92	76½	29.11	9.86	11.60
31M 30S	Do. 7¼pc A Deb. '91-94	74½	31.3	9.88	11.50
31M 30S	Do. 9pc 'A' '91-94	84	31.3	10.71	11.55
31A 28F	Do. 8⅞pc Ln. '92-97	82	28.2	11.08	12.65
Building Societies					
19Oct 25Mar	Nat'wide 14½pc 25.4.83	100¼xd	25.4	—	—
17 Nv 23 May	Do. 13⅞pc 23.5.83	100¼	18.10	13.84	11.49
7Dec 13June	Do. 13⅜pc 13.6.83	100¼	8.11	13.90	11.97
28Dec 4July	Do. 14pc 4.7.83	100½	29.11	13.93	11.37
19Jan 25July	Do. 13½pc 25.7.83	100½	19.1	13.06	11.17
9Feb 15Aug	Do. 11⅞pc 15.8.83	100⅛	9.2	11.86	11.41
23Feb 30Aug	Do. 11¼pc 30.8.83	100⅛	24.1	11.24	10.79
27 Mar 3 Oct	Do. 11⅜pc 3.10.83	100¼	27.3	11.35	10.79
—	Do 9⅞pc 31.10.83	99½xd	25.4	10.04	10.98
—	Do. 9⅞pc 28.11.83	99⅛	—	9.96	11.39
—	Do. 11¼pc 19.12.83	100⅛	—	11.24	11.08
—	Do. 11⅞pc 23.1.84	100⅝	—	11.80	11.04
—	Do. 11⅞pc 13.2.84	100⅝	—	11.80	11.10

FOREIGN BONDS & RAILS

Interest Due	Stock	Price £	Last xd	Div % Gross	Red. Yield
—	Chinese 4½pc 1898	11	—	—	—
30S 30M	Do. 5pc 1912	11	—	—	—
15a 1J	Do. 5pc 1913	9	—	—	—
—	Do. 5pc '25 Boxer	8	—	—	—
1M 1N	Greek 7pc Ass.	45	1.11	3½	8.07
1F 1A	Do 6pc 28 Stb Ass.	43	2.8	3	7.00
1A 1O	Do 4pc Mixed Ass.	40	1.10	2	5.07
1May 1Nov	Hung. '24 Ass.	31½	1.5	2¼	f9.98
30N 31M	Hydro Quebec 15pc Ln 2011	116¾	1.11	13.50	13.45
30J 31D	Iceland 6½pc '83-88	75	3.12	6½	£74
31J 31J	Do 14½pc Ln 2016	107½	6.1	14½	13.84
10Ja 10J	Ireland 7¼pc '81-83	100¼	10.12	7¼	11.31
1M 1S	Do 9¾pc '91-96	83	1.12	9¾	12.53
1J 1O	Japan 4pc '10 Ass	303	1.12	—	—
30J 31D	Do. 6pc '83-88	81½	31.12	6	10.99
1A 1O	Peru Ass. 2007	161	1.10	5.22	9.82
30S 31M	Pet. Mx 14½pc '06	61¾	1.9	14½	23.63
May 1	Turin 9pc 1991	S75	4.4	9	f12.00
15A 15O	Turin 6½pc 1984	0M90	15.10	6½	11.40

AMERICANS

Dividends Paid	Stock	Price £	Last xd	Div. Gross	C'vr	Y'ld Gr's
F.My.Ag.N.	Abbott Labs.	28⅛	1.11	$1.00	—	2.4
F.My.Ag.N	Alcoa 1$	21⅞	1.11	$1.20	—	3.6
Ma.Ju.Se.De.	Amax $1	16	5.11	20c.	—	0.8
Fb My.Au.Nr.	Amdahl	25	26.1	40c	—	1.1
F.M.A.S.	Amer Express $0.60	40⅛	4.1	$1.80	—	3.0
F.My.Au.N.	Amer. Medical Intl. $1	21¼xd	6.4	48c	—	1.3
M.A.N.F.	Amer. Nat. Res. $1	23	12.10	$3.16	—	9.2
—	American T. & T. Co.	43¼xd	28.3	$5.40	—	8.4
M.J.S.D.	Amfac Inc	17	16.11	$1.44	—	3.6
F.M.A.N	Bank America Corpn.	14	27.1	$1.52	—	7.2
A. J. O. Ja.	Bankers N.Y. $10	27⅛	24.3	$2.25	—	3.6
M.Je.S.D	Beth Steel $8	14⅛	4.11	60c	—	2.8
Ja.Ap.Jy.O	Brown'g Fer. c16⅔	25⅛	14.3	80c	—	2.1
F.My.Au.N.	Brunswick Corpn.	18⅝xd	28.1	$1.00	—	3.6
J.Ap.Jy.O.	C.P.C. $½	23⅞xd	28.3	$2.20	—	6.3
—	Campbell Soup	29¼xd	5.4	$2.20	—	5.0
F.My.Au.N.	Caterpillar	26⅛	4.1	$1.50	—	3.0
F.MyAuN	Chase M'htn.$12.5	36xd	27.1	$3.50	—	6.5
Mr.Je.S.O.	Chesebrough $1	25¼	1.3	$1.84	—	4.9
Mr.Jn.S.D.	Chrysler $6¼	11¼	5.79	—	—	—
My.Au.N.F.	Citicorp $4	27⅞	25.3	$1.88	—	4.6
My.Au.N.F.	City Inv. $1.25	20¼xd	29.3	$1.80	—	6.0
MyAuN.F.	Do. Cm. Prf. B $1	31¼	28.12	$2.00	—	4.3
F.My.Au.N.	Colgate-P. $1	15xd	20.1	$1.28	—	3.7
Ma.Ju.Se.De.	Colt Inds. $1	23¼	14.3	$1.80	—	3.2
O Ja Ap Jy	Cons. Foods $1⅓	29¼	25.11	$2.32	—	3.3
F.M.A.N	Cont. Illinois $5	15½xd	29.12	$2.00	—	8.1
Ap.Jy.O.Ja.	Crown Zell. $5	18⅝	4.3	$1.00	—	3.5
—	Damson Oil US$0.4	525p	—	—	—	—
Mr.Jn.Sp.Dc.	Dana Corp. $1	20¼	18.2	$1.60	—	5.2
F.M.A.N.	Eaton Crp. $0.50	22¾	2.2	80c	—	2.4
J.A.J.O.	Esmark $1	42¾xd	8.3	$1.84	—	2.9
Mr.Jn.S.O.	Exxon	20½	5.11	$3.00	—	9.8
F. M. A. N.	Fin. Corp. America	22¾	23.2	68c	—	2.0
J.A.J.O	First Chicago $5	14⅝	1.3	$1.20	—	3.5
J. Ap. Jy. O.	Fluor Corp. $⅝	13¾xd	22.3	80c	—	3.9
Mr.Je.S.O.	Ford Motor $2	25½	10.81	—	—	—
Mr.Jn.S.O.	GATX $⅝	18¼	7.3	$2.40	—	8.8
Apr. Oct.	Gen. Elect. $2½	69	3.3	$3.40	—	5.5
Mr.Ju.S.D.	Gillette $1	32⅞xd	27.1	$2.30	—	4.7
F.M.O.N.	Gulf Oil	21½	1.2	$2.80	—	8.7
Mr.Ju.S.O.	Honeywell $1.50	60	22.2	$3.60	—	4.0
M.J.S.O.	Hutton (E. F.) $1	31⅞	31.8	80c	—	1.7
Mr.Je Sep.Dc.	I.B.M. Corp. $1.25	68⅝	4.11	$3.44	—	3.3
Mr.Ju.S.O.	Ingersoll-R $2	20	10.2	$2.60	—	6.2
—	Insilco $1	16⅛	4.1	$1.00	—	4.1
Mr.Je.S.O.	I. U. International	12½	7.2	$1.15	—	6.1
J.A.J.O.	Int. Tel. & Tel. $1	23½	7.2	$2.76	—	7.9
F.MyAuN.	Kaiser Al. $⅓	11¼	2.2	60c	—	3.4
M.A.N.M.	Lone Star Inds.	21	1.3	$1.90	—	6.1
Ma.Ju.S.D.	Louisiana Land $0.15	19⅛	24.2	$1.00	—	3.5
Jn.Ap Jy.Oc	Lowes US$0.50	26xd	11.1	52c	—	1.3
J.A.J.O	Manf. Han. US$7.50	28⅞	27.1	$3.04	—	7.2
FeMyAuN	Merrill Lynch $1	56	31.1	$1.44	—	1.7
Ja.Ap.Jy.O.	Morgan (JP) US$2.5	51	15.12	$3.70	—	6.8
N. F. My. Au.	Norton Simon Inc. $1	15¼	1.2	$1.08	—	4.7
M.J.S.D.	Pennzoil Co.	24⅜	24.11	$2.20	—	6.0
Je Dc.J.A.	Quaker Oats US$5	29¼xd	17.3	$2.00	—	4.5
J.A.J.O.	Rep. N.Y. Corp. $5	32⅝xd	10.3	$1.52	—	3.1
F.MyAuN.	Rexnord $5	980p	8.2	40c	—	2.7
M.J.S.D	Rockwell Intl. $1	33¼	16.2	$1.56	—	3.1
Mr.Ju.S.O.	Saul (B. F.) $1	664p	15.10	20c	—	2.0
Mr.Je.S.O.	Shell Oil $1	25⅛	1.9	$1.80	—	4.7
Fb.My.Ag.Dc.	Simplicity Patt.	583p	31.8	56c	—	6.4
Au.N.F.My.	Sperry Corp. $0.50	23xd	5.4	$1.92	—	5.6
M.J.S.D	Sun Co. Inc.	22½	5.11	$2.30	—	6.8
Ma.Ju.Se.Dec.	TRW Inc. $1¼	40⅝	16.2	$2.60	—	4.3
Feb My Au Nov	Tenneco $5	24	1.2	$2.72	—	7.6
June Dec.	Do. 10¼% Ln. Stk. 91-95	138	15.11	10%	—	17.3
N.J.S.O.	Tesoro Pt. US$0.16⅔	988p	4.11	40c	—	2.7
Mr.Je.S.O.	Texaco $6.25	21¾	2.2	$3.00	—	9.2
Mr.Ju.S.D.	Time Inc. $1	38¼	20.1	$1.00	—	1.7
Ja.Ap.Ju.O.	Transamerica $1	18¼xd	30.3	$1.50	—	5.5
M J S D	Union Carbide $1	38½	1.11	$3.40	—	3.9
MarJnSpDc	Utd. Tech. $US5	46⅛	21.2	$2.40	—	3.5
Mr.Je.S.O.	U.S. Steel $1	15	30.10	$1.00	—	4.5
Mr.Je.S.O.	Woolworths $3½	22½	27.1	$1.80	—	5.4
O.Ja.Ap.Jy.	Zapata Corp. 25c.	10¼	12.1	84c	—	5.5

CANADIANS

Dividends Paid	Stock	Price £	Last xd	Div. Gross	C'vr	Y'ld Gr's
Ma.S.J.O.	Bk. Montreal $2	16⅛	7.2	$1.96	—	6.5
J.A.J.D	Bk. Nova Scot.	22⅜xd	30.3	$1.92	—	4.6
A.Jy.O.Ja.	Bell Canada $8⅓	13½xd	15.3	$2.08	—	8.3
May Nov.	Bow Valley	921p	15.12	15c	—	0.9
J.A.J.D.	Brascan	14⅜	1.2	$1.60	—	5.8
F.MyAuN.	Can. Imp. Bk. $2	19⅛xd	29.3	$2.08	—	3.9
July Jan.	Can. Pacific $5	22⅜xd	30.12	$1.40	—	3.3
July Jan.	Do. 4pc Deb. £100	34¼	15.11	4%	—	11.6
Ja Ap Jy Oc	Can. P. Ent.	11⅞	16.12	80c	—	3.6
J.Ap.Jy.O.	Gulf Can.	780p	—	44c	—	3.0
Ap.Jy.D.Ja.	Hawker Sid Can.	941p	15.11	96c	—	5.5
F.MyAuN.	Hollinger $5	15¼	26.7	s$2.20	—	7.6
Mr.Jn.Sp.Dc.	Hudson's Bay	12	11.1	60c	—	2.7
Mr.Je.S.O.	Imperial Oil	16⅝	26.11	$1.40	—	4.5
Jan.Ag.J.O.	Inco	823p	18.2	$US20c	—	1.6
F.My.Au.N.	Intl. Nat. Gas $1	720p	30.10	$1.10	—	8.2
Mr.Je.S.D.	Massey Ferg.	216p	10.77	—	—	—
June Dec.	Rio Algom	24⅞	5.11	$1.50	—	3.3
M.Je.S.O.	Royal Bk. Can. $1	17⅞xd	25.1	$2.00	—	6.2
SeDeMrJu	Seagram Co. C$1	17⅝	15.2	US$2.04	—	7.7
—	Talcorp	72p	—	—	—	—
—	Do. Pref. $3	1250	—	10%	—	12.9
F.MyAuN.	Tor. Dom. Bk.	25xd	29.3	$2.00	—	4.3
J.Ap.Jy.O.	Trans Can Pipe	13¾	1.12	$1.28	—	5.2

BANKS, H.P. & LEASING

Dividends Paid	Stock	Price	Last xd	Div Net	C'vr	Y'ld Gr's	P/E
Jan. July	ANZ $A1	205	31.12	028c	3.1	7.8	4.1
Feb. Aug.	Alexanders D. £1	278	21.2	20.0	—	10.3	—
May Aug.	Algemene Fl.100	£88	17.8	026%	ϕ	7.4	ϕ
Dec. June	Allied Irish	118	15.11	045.3%	4.0	8.8	3.6
July	Arbuthnot (H.) 50p	86	5.7	3.5	—	3.8	—
July Jan	Bk. Ireland £1	285	15.11	029.4%	—	9.4	—
May Nov.	Bank Leumi	2	18.5	—	—	—	—
Aug. Feb.	Bk. Leumi (UK) £1	265	7.3	10.15	—	8.8	—

INDUSTRIALS—Continued

INSURANCES

LEISURE

LEISURE—Continued

MOTORS, AIRCRAFT TRADES

Motors and Cycles

Commercial Vehicles

Components

Garages and Distributors

NEWSPAPERS, PUBLISHERS

PAPER, PRINTING ADVERTISING

PROPERTY

PROPERTY—Continued

SHIPPING

SHOES AND LEATHER

SOUTH AFRICANS

TEXTILES

TOBACCOS

TRUSTS, FINANCE, LAND

Investment Trusts

INVESTMENT TRUSTS-Cont.

Finance, Land, etc.

OIL AND GAS

OIL AND GAS—Continued

OVERSEAS TRADERS

PLANTATIONS

Rubbers, Palm Oil

Teas

MINES

Central Rand

Eastern Rand

Far West Rand

O.F.S.

Finance

Diamond and Platinum

MINES—Continued

Central African

Dividends Paid		Stock	Price	Last xd	Div Net	C'vr	Y'ld Gr's
Nov.	May	Falcon Rh.50c	250	1.9	Q25c	10.3	6.4
Nov.	May	Wankie Col. Z$1	19	4.10	Q5c	♦	18.9
—		Zam.Cpr.SBD0.24	20	9.80	—	—	—

Australians

Dividends Paid		Stock	Price	Last xd	Div Net	C'vr	Y'ld Gr's
—		♥ACM 20c	16½	—	—	—	—
—		♥Argey Gold NL 25c	7	—	♦	—	—
—		Balmoral Resources	17½	—	—	—	—
—		♥Black Hill Mins.	47	—	—	—	—
—		♥Bond Corp.	56½	—	g0.10c	2.3	10.9
Nov.	Apr.	♥Bougainville 1 Kina	135	7.3	Q3.42c	1.2	1.5
May	Nov	♥CRA 50c	270	15.3	Q3c	—	0.6
—		♥Carr Boyd 20c	76xr	—	—	—	—
—		♥Central Pacific	19	—	—	—	—
—		♥Crusader Oil	245	—	—	—	—
—		♥Cultus Pac NL	8½	—	—	—	—
—		♥Eagle Corp 10c	11½	—	—	—	—
—		♥Endeavour 20c	8½	—	—	—	—
Apr	Oct	♥G M Kalgoorlie 25c	525	28.9	b010c	♦	1.1
Sept.	Feb.	Hampton Areas 10p	172xr	13.12	13.75	2.8	3.1
—		♥Haoma NW	16	—	—	—	—
—		♥Hill Minerals N.L.	47	—	—	—	—
—		♥Intnl Mining	13	—	—	—	—
—		♥Kalbara Min 20c	36½	—	—	—	—
—		♥Keywest Expl	14	—	—	—	—
—		♥Kitchener NL 25c	56	—	—	—	—
—		♥Meekatharra 25c	100	—	—	—	—
—		♥Metals Ex 50c	32	14.9	—	—	—
—		♥Metramar Mins 20c	25	—	—	—	—
—		♥Mid East Mins A$1	24	—	—	—	—
Oct.	Apr.	♥MIM Hldgs 50c	254	12.2	Q5c	—	1.1
—		♥Mincorp 20c	7	—	—	—	—
—		♥Minefields Expl 25c	5	—	—	—	—
—		♥Newmetal 20c	29	—	—	—	—
June	Nov	♥North B Hill 50c	136	29.11	g06c	1.3	2.6
—		Nth. Kalgurli	41	—	—	—	—
May	Nov.	♥Oakbridge 50c	59	30.4	Q7c	1.7	7.0
—		♥Pacific Copper	48	—	—	—	—
—		♥Pancont'l 25c	84	—	—	—	—
—		Paringa Mng & Expl 5p	48	—	—	—	—
Apr.	Oct.	♥Peko-Wallsend 50c	328	15.3	Q15c	—	0.3
—		♥Pelsart Res NL	6	—	—	—	—
—		♥Renison 50c	230	—	†05c	—	‡
—		♥Do Defd	195	—	—	—	—
—		♥Seltrust 50c	62	—	—	—	—
—		♥Southern Pacific	8	—	—	—	—
—		♥Swan Res 20c	40	—	—	—	—
—		Utd Goldfields Cpn NL	30	—	—	—	—
—		♥West Coast 25c	12	—	—	—	—
—		♥Western Core. 50c	23	—	—	—	—
Oct.	May	Westn. Mining 50c	250	4.10	†Q2½c	♦	‡
—		♥Whim Creek 20c	61	—	—	—	—

Tins

Miscellaneous

Dividends Paid		Stock	Price	Last xd	Div Net	C'vr	Y'ld Gr's
—		♥Anglo Utd. Dev.	86	—	—	—	—
—		♥Colby Res Corp.	82	—	—	—	—
Aug.	Feb.	Cons. Murch. 10c	430	23.12	†Q60c	1.9	‡
—		♯♯Explaura Gold	3	—	—	—	—
—		♥Highwood Res.	110	—	—	—	—
—		Homestake Mining $1	£19¼	—	Q40c	—	1.4
—		Northgate C$1	375	9.77	—	—	—
Jan.	July	R.T.Z.	533	1.11	16.0	1.6	4.3
Jan.	July	Do.9¾%Cv.Ln.'95-2000	£116½	1.11	Q9¾%	23.9	18.3
—		♥Sabina Inds C$1	24	—	—	—	—
	May	♯Southwest Res 10p	14½	13.12	—	—	—
—		♥Tara Exptn $1	465	—	—	—	—

NOTES

Unless otherwise indicated, prices and net dividends are in pence and denominations are 25p. Estimated price/earnings ratios and covers are based on latest annual reports and accounts and, where possible, are updated on half-yearly figures. P/Es are calculated on "net" distribution basis, earnings per share being computed on profit after taxation and unrelieved ACT where applicable; bracketed figures indicate 10 per cent or more difference if calculated on "nil" distribution. Covers are based on "maximum" distribution; this compares gross dividend costs to profit after taxation, excluding exceptional profits/losses but including estimated extent of offsettable ACT. Yields are based on middle prices, are gross, adjusted to ACT of 30 per cent and allow for value of declared distribution and rights.

- ● "Tap" Stock.
- * Highs and Lows marked thus have been adjusted to allow for rights issues for cash.
- † Interim since increased or resumed.
- ‡ Interim since reduced, passed or deferred.
- ‡‡ Tax-free to non-residents on application.
- ♦ Figures or report awaited.
- ♥ Not officially UK Listed; dealings permitted under Rule 163(4)(a).
- ♠ USM; not listed on Stock Exchange and company not subjected to same degree of regulation as listed securities.
- ♯♯ Dealt in under Rule 163(3).
- ♯ Price at time of suspension.
- ¶ Indicated dividend after pending scrip and/or rights issue; cover relates to previous dividend or forecast.
- ♦ Merger bid or reorganisation in progress.
- ♦ Not comparable.
- ♦ Same interim; reduced final and/or reduced earnings indicated.
- ‡ Forecast dividend; cover on earnings updated by latest interim statement.
- ‡ Cover allows for conversion of shares not now ranking for dividends or ranking only for restricted dividend.
- ★ Cover does not allow for shares which may also rank for dividend at a future date. No P/E ratio usually provided.
- ¶ No par value.

B.Fr. Belgian Francs. Fr. French Francs. ♯♯ Yield based on assumption Treasury Bill Rate stays unchanged until maturity of stock. a Tax free. b Figures based on prospectus or other official estimate. c Cents. d Dividend rate paid or payable on part of capital, cover based on dividend on full capital. e Redemption yield. f Flat yield. g Assumed dividend and yield. h Assumed dividend and yield after scrip issue. j Payment from capital sources. k Kenya. m Interim higher than previous total. n Rights issue pending. q Earnings based on preliminary figures. s Dividend and yield exclude a special payment. t Indicated dividend: cover relates to previous dividend, P/E ratio based on latest annual earnings. u Forecast dividend: cover based on previous year's earnings. v Subject to local tax. x Dividend cover in excess of 100 times. y Dividend and yield based on merger terms. z Dividend and yield include a special payment: Cover does not apply to special payment. A Net dividend and yield. B Preference dividend passed or deferred. C Canadian. E Minimum tender price. F Dividend and yield based on prospectus or other official estimates for 1983-84. G Assumed dividend and yield after pending scrip and/or rights issue. H Dividend and yield based on prospectus or other official estimates for 1984. N Figures based on prospectus or other official estimates for 1982-83. M Dividend and yield based on prospectus or other official estimates for 1983. M Dividend and yield based on prospectus or other official estimates for 1982-83. P Figures based on prospectus or other official estimates for 1982. Q Gross. T Figures assumed. Z Dividend total to date.

Abbreviations: xd ex dividend; xc ex scrip issue; xr ex rights; xa ex all; xd ex capital distribution.

REGIONAL AND IRISH STOCKS

The following is a selection of regional and Irish stocks, the latter being quoted in Irish currency.

			IRISH		
Albany Inv. 20p	34	.....	Exch. 15pc 1983	£99⅞	.....
Bertrams	17½	.....	Nat. 9¾% 84/89	£86½	.....
Bdy'wtr. Est. 50p	530	.....	Fin 13% 97/02	£94	+¼
Craig & Rose £1	£12	.....	Alliance Gas	105	.....
Finlay Pkg. 5p	34	.....	Arnott	180	.....
Graig Ship. £1	£19	.....	Carroll (P.J.)	101	.....
Higsons Brew.	103	−2	Concrete Prods.	52	.....
Holt (Jos) 25p	910	.....	Helton (Hldgs.)	11	−2
I.O.M. Stm. £1	95	+3	Irish Ropes	28	.....
Pearce (C. H.)	£14	.....	Jacob	65	.....
Peel Hldgs.	182	.....	T.M.G.	80	.....
			Unidare	51	+11

OPTIONS

3-month Call Rates

Industrials					
		House of Fraser	15	Utd. Drapery	7
Allied-Lyons	15	I.C.I.	24	Vickers	12
BOC Grp.	17	"Imps"	10	Woolworth Hld.	15
B.S.R.	12	I.C.L.	8		
Babcock	18	Ladbroke	16	**Property**	
Barclays Bank	35	Legal & Gen.	28	Brit. Land	7½
Beecham	35	Lex Service	16	Cap. Counties	12
Blue Circle	44	Lloyds Bank	35	Land Sec.	26
Boots	22	"Lots"	4	MEPC	17
Bowaters	19	London Brick	11	Peachey	14
Brit. Aerospace	20	Lucas Inds.	12	Samuel Props.	19
B.A.T.	50	"Mams"	12	Town & City	8
Brown (J.)	4	Mrks. & Spncr	16		
Burton Ord.	24	Midland Bank	30	**Oils**	
Cadburys	11	N.E.I.	9		
Courtaulds	6	Nat. West. Bank	38	Brit. Petroleum	26
Debenhams	8½	P & O Dfd.	14	Burmah Oil	12
Distillers	20	Plessey	50	Charterhall	5
Dunlop	5½	Racal Elect.	45	KCA	8
Eagle Star	30	R.H.M.	6	Premier	4
F.N.F.C.	4	Rank Org. Ord.	15	Shell	35
Gen. Accident	30	Reed Intnl.	26	Tricentrol	22
Gen. Electric	24	Sears	9	Ultramar	42
Glaxo	45	T.I.	13		
Grand Met.	25	Tesco	8	**Mines**	
G.U.S. 'A'	50	Thorn EMI	38	Charter Cons.	20
Guardian	35	Trusthouse	13	Cons. Gold	48
G.K.N.	15	Turner & Newall	4	Lonrho	8
Hawker Sidd.	30	Unilever	65	Rio T. Zinc	42

"Recent Issues" and "Rights" Page 14

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CURRENCIES, MONEY and CAPITAL MARKETS

FOREIGN EXCHANGES

Sterling pauses for breath

BY JONAS CROSLAND

Sterling finished below its best levels of the week as the market reacted to the recent sharp rise. The firmer trend was principally an upward technical correction with short covering accounting for much of the rise. Apart from the inevitable profit taking sterling's rise was checked by two other factors. First there was some reaction to the prospect of a cut in UK clearing bank base rates. This however does not appear as imminent as had been thought earlier in the week. Secondly the pound was affected by the dollar's steady performance as the market remained uncertain over U.S. interest rate trends.

How much of sterling's recovery reflected its previous oversold position and how much could be apportioned to North Sea oil prices remains to be seen. Some have argued that sterling should never have been as low as it was. It certainly seems dangerous to look too far ahead since sterling remains extremely sensitive to any further oil price developments in which case economic rationale goes out of the window.

End of quarter technicalities had served to keep U.S. Federal funds well above the 9 per cent level but there was little indication of any sustained fall last week and there was consequently no rush to go short on dollars.

The European Monetary System continued to adjust itself after last month's realignment. The Dutch guilder has come under a little bit of pressure. The realignment effectively reduced its value against the D-mark and this has appeared to focus attention on some of the less favourable aspects of the Dutch economy. There seems to be little likelihood of any sustained pressure however. Dutch interest rates are among the lowest in Europe leaving room for the authorities to sponsor some upward adjustment if necessary. In fact interest rates were marked a little higher last week not through any sizeable tightening of credit by the central bank but more as a reflex action in defence of the guilder.

FORWARD RATES AGAINST STERLING

	Spot	1 month	3 month	6 month	12 month
Dollar	1.5050	1.5038	1.5021	1.5016	1.4998
D-Mark	3.6525	3.6350	3.6063	3.5678	3.4946
French Franc	10.95	10.9750	11.0575	11.2083	11.5311
Swiss Franc	3.10	3.0838	3.0525	3.0104	2.9290
Japanese Yen	360.5	359.2	357.0	354.0	348.8

EMS EUROPEAN CURRENCY UNIT RATES

	ECU central rates	Currency amounts against ECU April 8	% change from central rate	% change adjusted for divergence	Divergence limit %
Belgian Franc ...	44.3662	44.6921	+0.73	+0.32	±1.5430
Danish Krone ...	8.04412	7.98108	−0.78	−1.19	±1.6419
German D-Mark	2.21515	2.24712	+1.44	+1.03	±1.0567
French Franc ...	6.79271	6.73812	−0.80	−1.21	±1.4010
Dutch Guilder ...	2.49587	2.53224	+1.46	+1.05	±1.4941
Irish Punt	0.71705	0.711332	−0.80	−1.21	±1.6856
Italian Lira	1386.78	1339.37	−3.42	−3.42	±4.1463

Changes are for ECU, therefore positive change denotes a weak currency. Adjustment calculated by Financial Times.

BANK OF ENGLAND TREASURY BILL TENDER

	April 8	March 31		April 8	March 31
Bills on offer	£100m	£100m	Top accepted rate of discount	9.8871%	10.2280%
Total of applications	£456.885m	£320.585m	Average rate of discount	9.8194%	10.2175%
Total allocated	£100m	£100m	Average yield	10.07%	10.48%
Minimum accepted bid	£97.535	£97.45	Amount on offer at next tender	£100m	£100m
Allotment at minimum level	2%	83%			

OTHER CURRENCIES

Apr. 8	£	$		£ Note Rates
Argentina Peso..	14,059-104239	09,240-69,290	Austria	25.45-25.70
Australia Dollar..	1.7365-1.7385	1.1545-1.1555	Belgium	73.35-74.10
Brazil Cruzeiro..	637.04-638.04	423.98-428.10	Denmark	12.90-13.09
Finland Markka..	8.1825-8.2085	5.4435-5.4465	France	10.81-11.01
Greek Drachma..	124.370-127.526	83.50-84.00	Germany	3.63¾-3.07¼
Hong Kong Dollar	10.11-10.15	6.7165-6.7210	Italy	2140-2170
Iran Rial	128.20*	85.00*	Japan	358-363
Kuwait Dinar (KD)	0.4405-0.4415	0.2929-0.2930	Netherlands	4.09½-4.15½
Luxembourg Fr..	72.60-72.76	48.28-48.30	Norway	10.74-10.84
Malaysia Dollar..	3.4675-3.4875	2.2975-2.3075	Portugal	143-155
New Zealand Dlr.	2.2970-2.3020	1.5275-1.5295	Spain	194¼-209
Saudi Arab. Riyal	5.1865-5.1945	3.4500-3.4515	Sweden	11.18-11.29
Singapore Dollar	3.1050-3.1850	2.0975-2.1075	Switzerland	3.08¼-3.11¼
Sth. African Rand	1.6510-1.8530	1.0970-1.0985	United States	1.49¾-1.51¾
U.A.E. Dirham....	5.5215-5.5290	3.6715-3.6735	Yugoslavia	117-131

*Selling rates.

CURRENCY MOVEMENTS

Apr. 8	Bank of England Index	Morgan Guaranty Change %
Sterling	80.0	−69.4
U.S. dollar	122.0	+12.6
Canadian dollar	90.0	−17.8
Austrian schilling	122.1	+61.2
Belgian franc	94.7	−1.0
Danish kroner	84.9	−9.1
Deutsche mark	131.0	+88.3
Swiss franc	150.0	+106.3
Guilder	118.7	+26.0
French franc	70.9	−22.7
Lira	52.4	−59.1
Yen	144.8	+38.6

Based on trade weighted changes from Washington agreement December 1971. Bank of England Index (base average 1975=100).

CURRENCY RATES

April 8	Bank rate %	Special Drawing Rights	European Currency Unit
Sterling	—	0.717972	0.615094
U.S. $	8½	1.08062	0.997291
Canadian $	8.64	*	1.14519
Austria Sch	3¾	18.4030	10.8045
Belgian F	11	52.1291	44.6921
Danish Kr	8½	9.29336	7.98105
D mark	4	2.61964	2.24712
Guilder	5½	2.95279	2.53294
French F	9½	7.85567	6.73612
Lira	17	n.a.	1339.37
Yen	5½	257.404	221.606
Norwgn Kr	9	7.75184	0.63288
Spanish Pta	—	146.802	126.065
Swedish Kr	8½	8.08088	0.94596
Swiss Fr	4	2.22521	1.90841
Greek Dr'ch	20½	90.9542	77.8310

*CS/SDR rate for April 7: 1.33947.

THE POUND SPOT AND FORWARD

April 8	Day's spread	Close	One month	% p.a.	Three months	% p.a.
U.S.	1.5010-1.5110	1.5045-1.5055	0.15-0.10c pm	1.00	0.32-0.27 pm	0.78
Canada	1.8530-1.8640	1.8575-1.8585	0.15-0.05c pm	0.64	0.33-0.23 pm	0.60
Nethlnd.	4.08¼-4.12¼	4.11¾-4.12¾	2¾-1¾c pm	5.46	5¾-5¼ pm	0.22
Belgium	72.25-72.85	72.65-72.75	5-15c dis	−1.65	28-38 dis	−1.81
Denmark	12.90-12.98	12.96-12.97	4-5¾ore dis	−4.34	11¼-12¾dis	−3.74
Ireland	1.1625-1.1690	1.1660-1.1680	0.57-0.69p dis	−0.53	1.39-1.67dis	−5.10
W. Ger.	3.63-3.66½	3.64¼-3.65¼	2-1½pf pm	5.76	4⅞-4¾ pm	5.06
Portugal	145.25-147.50	146.25-147.25	400-1635c dis	−79.11	880-2240dis	−39.79
Spain	204.00-205.40	204.25-204.45	130-250c dis	−11.16	410-575 dis	−9.64
Italy	2,164-2,180	2,173½-2,175½	9-12lire dis	−5.79	36-41 dis	−7.08
Norway	10.74-10.81	10.77½-10.78½	2¾-3¼ore dis	−3.20	8¼-9¼ dis	−3.32
France	10.89-10.97	10.94½-10.95½	2-3c dis	−2.74	10-11½ dis	−3.93
Sweden	11.23-11.31	11.27½-11.28½	¼-1ore dis	−0.66	1¾-2¾ dis	−0.77
Japan	358-363	360-361	1.30-1.10y pm	3.99	3.55-3.35 pm	3.83
Austria	25.50-25.75	25.67-25.72	10⅞-10¾gro pm	4.90	32-27 pm	4.59
Switz.	3.08-3.11½	3.09½-3.10½	1⅞-1⅝c pm	6.29	5-4½ pm	6.13

Belgian rate is for convertible francs. Financial franc 73.70-73.80. Six-month forward dollar 0.38-0.33c pm. 12-month 0.60-0.45c pm.

THE DOLLAR SPOT AND FORWARD

April 8	Day's spread	Close	One month	% p.a.	Three months	% p.a.
UK†	1.5010-1.5110	1.5045-1.5055	0.15-0.10c pm	1.00	0.32-0.27 pm	0.78
Ireland†	1.3005-1.3060	1.3015-1.3035	0.85-0.70c pm	7.14	2.00-1.70 pm	5.68
Canada	1.2340-1.2365	1.2340-1.2360	0.01c pm-0.02dis	−0.06	0.01-0.04dis	−0.08
Nethlnd.	2.7245-2.7360	2.7330-2.7360	1.16-1.06c pm	4.88	3.20-3.10 pm	4.61
Belgium	48.14-48.35	48.28-48.30	11-14c dis	−3.10	30-34 dis	−2.65
Denmark	8.5960-8.6125	8.6025-8.6075	3.10-3.60ore dis	−4.67	8.25-8.75dis	−3.95
W. Ger.	2.4165-2.4295	2.4245-2.4255	0.99-0.94pf pm	4.77	2.71-2.66 pm	4.43
Portugal	96.70-98.30	97.25-98.25	275-1025c dis	−79.79	475-1900dis	−40.41
Spain	135.65-136.05	135.70-135.80	100-180c dis	−11.47	325-425dis	−11.03
Italy	1,442½-1,448	1,444½-1,445½	9¼-11lire dis	−5.51	29-31 dis	−8.30
Norway	7.1520-7.1675	7.1625-7.1675	2.40-2.80ore dis	−4.36	6.90-7.30dis	−3.57
France	7.2600-7.2850	7.2750-7.2800	1.80-2.20c dis	−3.30	8.00-8.75dis	−4.60
Sweden	7.4850-7.4900	7.4940-7.4900	0.90-1.10ore dis	−1.60	2.80-2.90dis	−1.44
Japan	238.30-239.80	239.25-239.35	0.66-0.61y pm	3.15	1.90-1.82 pm	3.11
Austria	17.01-17.05½	17.03½-17.04½	6¼-5¼gro pm	4.14	18-15½ pm	3.93
Switz.	2.0470-2.0640	2.0585-2.0595	0.97-0.92c pm	5.51	2.80-2.75 pm	5.39

† UK and Ireland are quoted in U.S. currency. Forward premiums and discounts apply to the U.S. dollar and not to the individual currency. Belgian rate is for convertible francs. Financial franc 48.95-49.05.

EXCHANGE CROSS RATES

Apr. 8	Pound St'rling	U.S. Dollar	Deutschem'k	JapaneseYen	FrenchFranc	Swiss Franc	Dutch Guild	Italian Lira	Canada Dollar	Belgian Franc
Pound Sterling	1	1.505	3.653	360.5	10.96	3.100	4.116	2175.	1.856	72.70
U.S. Dollar	0.664	1.	2.427	239.0	7.276	2.060	2.736	1445.	1.230	48.31
Deutschemark	0.274	0.418	1.	98.70	2.998	0.849	1.127	595.3	0.509	19.90
Japanese Yen 1,000	2.774	4.175	10.13	1000.	30.37	8.599	11.42	6032.	5.154	201.7
French Franc 10	0.913	1.374	3.336	320.2	10.	2.831	3.760	1986.	1.697	66.39
Swiss Franc	0.323	0.485	1.178	116.3	3.532	1.	1.328	701.0	0.599	23.45
Dutch Guilder	0.243	0.366	0.887	87.50	2.659	0.753	1.	528.1	0.451	17.66
Italian Lira 1,000	0.460	0.692	1.680	165.8	5.036	1.428	1.894	1000.	0.854	33.43
Canadian Dollar	0.538	0.810	1.966	194.0	0.898	1.668	2.216	1170.	1.	39.13
Belgian Franc 100	1.376	2.070	5.024	495.8	10.00	4.264	5.664	2991.	2.556	100.

MONEY MARKETS

Attention focussed on UK base rates

Last month's North Sea oil price proposals by BNOC effectively gave the green light firstly for a sharp upward correction in the value of sterling followed by a rapid fall in UK interest rates. So far this has all been fairly predictable stuff given previous market attitudes that it was only the weakness of sterling that was keeping rates firm. Earlier this year base rates were jacked up to 11 per cent in response to sterling's weakness in a hardly popular but entirely logical move. There may have been a case for even higher rates although the Bank of England was generous in its day to day operations on more than one occasion, effectively keeping the lid on short term rates.

The three-month interbank rate has fallen half a point in just over a week with shorter term rates a lot steadier so that there is now a more pronounced reverse yield curve.

Steady progress had been made up until Thursday when the Bank of England effectively turned on the hoses to dampen things down. Discount houses had little success on Thursday morning with the Bank buying only £95m of bills at unchanged rates. To emphasise the point the market was left over £200m short on the projected deficit and while the tone of the market remained bullish there was little doubt that the pace of the recent decline was a little too rapid for the Bank's liking.

One could argue that any sustained fall in rates based mainly on sterling's continued better performance is hardly a substantial base although this remains to be seen. Hopes of a cut this week would most probably benefit from some lead in U.S. markets but once again there has so far been little real indication that such a move is imminent. However this week should see further signs of a mild if rather restricted upturn in U.S. economic activity which may provide a more favourable basis for a definite downward move.

LONDON MONEY RATES

Apr. 8 1983	Sterling Certificate of deposit	Interbank	Local Authority deposits	Local Auth. negotiable bonds	Finance House Deposits	Company Deposits	Discount Market Deposits	Treasury Bills ♦	Eligible Bank Bills ♦	Fine Trade Bills ♦
Overnight	—	2-12¼	—	—	—	10-11¼	6-10½	—	—	—
2 days notice	—	—	10⅝	—	—	—	—	—	—	—
7 days or	—	—	—	—	—	11-11¼	—	—	—	—
7 days notice	—	10⅝-10⅞	10⅝	—	—	10¾	10½	—	—	—
One month	10⅛-10½	10⅛-10⅜	10½	11⅛-10¾	10¾	10⅝	10¼	10⅝	10⅛	11⅛
Two months	10⅛-10⅛	10⅛-10⅛	10⅜	11-10⅝	10¾	10⅝	10½	10⅛	10⅛	10⅞
Three months	10⅛-10	10¼-10⅜	10¼	10⅞-10½	10¾	—	10	10	10	10⅝
Six months	10¼-10⅛	10⅛-10⅛	10½	10-9¾	10⅝	—	—	—	9⅞	10½
Nine months	10¼-10⅛	10⅛-10⅛	10½	10⅝-10¼	10⅝	—	—	—	—	—
One year	10¼-10⅛	10⅛-10⅛	10⅛	10½-10½	10⅜	—	—	—	—	—
Two years	—	—	10¾	—	—	—	—	—	—	—

ECGD Rate Export Finance Scheme IV Average Rate for interest period March 2 to April 5 1983 (inclusive) 10.974 per cent.

Local authorities and finance houses seven days' notice, others seven days fixed. Long-term local authority mortgage rates nominally three years 11 per cent; four years 11¼ per cent; five years 11¼ per cent. ♦ Bank bill rates in table are buying rates for prime paper. Buying rate for four months bank bills 9⁵⁄₁₆ per cent; four month trade bills 10⅜ per cent.

Approximate selling rate for one month Treasury bills 10⅛ per cent; two-months 10³⁄₁₆ per cent; and three months 9⅞ per cent. Approximate selling rate for one month bank bills 10⁵⁄₁₆ per cent; two month 10⅛ per cent and three months 9¹⁵⁄₁₆ per cent; trade bills 10²⁵⁄₃₂ per cent; two months 10⅝ per cent and three months 10½ per cent.

Finance Houses Base Rates (published by the Finance Houses Association) 11½ per cent from April 1, 1983. London and Scottish Clearing Bank Rates for lending 10½ per cent. London Deposit Rates for sums at seven days' notice 7½ per cent.

Treasury Bills: Average tender rates of discount 9.8194 per cent. Certificates of Tax Deposit (Series 5). Deposits of £100,000 and over held under one month 10½ per cent; one-three months 10⅝ per cent; three-six months 10⅝ per cent; six-12 months 10⅝ per cent. Under £100,000 10 per cent from April 8. Deposits held under Series 3-5 10⅝ per cent. The rates for all deposits withdrawn for cash 8 per cent.

INTEREST RATES

EURO-CURRENCY INTEREST RATES

(Market closing rates)

Apr. 8	Short term	7 days notice	Month	Three Months	Six Months	One Year
Sterling	10¼-10¾	10½-10¾	10⅛-10⅜	10⅛-10⅞	10⅛-10¼	10¼-10⅜
U.S. Dollar	8¾-9	9-9¼	8⅞-9⅛	9⅛-9⅜	9⅛-9⅜	9⅜-9⅞
Can. Dollar	8¾-9¾	8¾-9¾	9⅛-8⅞	9⅜-9⅝	9⅛-9⅜	9⅞-10⅛
D. Guilder	4⅞-5⅛	4⅞-5	4⅜-4⅝	4⅞-5	5⅜-5⅝	5¾-5⅞
S. Franc	5¾-6¼	4-4¼	4-4⅛	3⅞-4⅛	3⅞-4⅛	3⅞-4⅛
Deutschm'rk	4⅛-4⅜	4⅛-4⅜	4⅛-4⅜	4⅞-5⅛	5⅛-5⅜	5⅛-5⅜
Fr'nch Franc	12¼-12¾	12¼-19¾	13½-15	13¾-14¼	14½-10	16½-18
Italian Lira	16-18	16-17½	16¼-17¾	17-18	17½-18¼	18-18⅞
Belg. Franc Conv.	11-12½	12-13½	12-13	11¾-12½	11¾-12½	11⅞-12⅜
Belg. Franc Fin.	18-19½	19-12¼	11⅛-11¾	11½-11¾	11⅜-11⅝	11⅜-11⅝
Yen	6⅛-6¼	6⅛-6¼	6⅛-6¼	6⅛-6⅜	6¼-6⅜	6⅜-6⅛
D. Krone	14½-10	14¾-15¼	14½-14⅝	13⅝-14⅛	13¾-14¼	14-14⅛
Asia $ (Sing.)	8⅞-9⅛	9⅛-9⅜	8⅞-9⅛	9⅛-9⅜	9⅛-9⅜	9⅜-9⅞

FT LONDON INTERBANK FIXING

(11.00 a.m. APRIL 8)

3 month U.S. dollars		6 months U.S. dollars	
bid 8 7/16	offer 9 9/16	bid 9 1/2	offer 9 5/8

The fixing rates are the arithmetic means, rounded to the nearest one-sixteenth, of the bid and offered rates for $10m quoted by the market to five reference banks at 11 am each working day. The banks are National Westminster Bank, Bank of Tokyo, Deutsche Bank, Banque Nationale de Paris and Morgan Guaranty Trust.

MONEY RATES

NEW YORK

Prime rate	10½
Fed funds (lunch-time)	8⅞-9⅛
Treasury bills (13-week)	8.32
Treasury bills (26-week)	8.42

GERMANY

Lombard	5.0
Overnight rate	4.75
One month	5.05
Three months	5.20
Six months	5.25

FRANCE

Intervention rate	12.5
Overnight rate	12.625
One month	12.5625
Three months	12.1875
Six months	11.9875

JAPAN

Discount rate	5.5
Call (unconditional)	6.40625
Bill discount (3-month)	6.78125

SWITZERLAND

Discount rate	4
Overnight rate	3-4
One month	4-4½
Three months	3¹⁵⁄₁₆-4¹⁄₁₆

NETHERLANDS

Discount rate	3½
Overnight rate	5-5½
One month	4¾-4⅞
Three months	4⅞-5
Six months	5⅛-5½

$ CERTIFICATES OF DEPOSIT

One month	9.05-9.15
Three months	9.10-9.20
Six months	9.20-9.30
One year	9.40-9.60

LONG TERM EURO $

Two years	10½-10¾
Three years	10⅞-11⅛
Four years	11⅛-11⅜
Five years	11½-11¾

SDR LINKED DEPOSITS

One month	8⅞-9⅛
Three months	8⁵⁄₁₆-8¹³⁄₁₆
Six months	8¾-9⅛
One year	8¹³⁄₁₆-9¹⁄₁₆

ECU LINKED DEPOSITS

One month	8⅞-9⁵⁄₁₆
Three months	8⅞-9⅛
Six months	9⅛-9⅜
One year	9⅛-9⁹⁄₁₆

FINANCIAL FUTURES

LONDON

THREE-MONTH EURODOLLAR
$1m points of 100%

	Close	High	Low	Prev
June	90.62	90.82	90.55	90.67
Sept	90.38	90.38	90.35	90.42
Dec	90.15	90.15	90.15	90.21
March	—	90.10	90.10	90.10
June	—	—	—	—

Volume 1,388 (1,640)
Previous day's open int. 4,211 (4,259)

THREE-MONTH STERLING DEPOSIT
£250,000 points of 100%

	Close	High	Low	Prev
June	90.25	90.28	90.18	90.25
Sept	90.23	90.29	90.20	90.24
Dec	90.25	90.26	90.20	90.24
March	90.16	90.16	90.16	90.14
June	90.05	90.06	90.05	90.04

Volume 792 (586)
Previous day's open int. 3,495 (3,372)

20-YEAR 12% NOTIONAL GILT
£50,000 32nds of 100%

	Close	High	Low	Prev
June	105-26	105-27	105-15	105-18
Sept	105-08	105-08	105-02	105-02
Dec	106-28	106-26	105-23	106-17
March	106-19	106-19	106-12	106-00
June	106-20	—	—	106-06

Volume 961 (1,259)
Previous day's open int. 2,435 (2,515)
Basis quote (clean cash price of 15½% Treasury 1998 less equivalent price of near futures contract) 11 to 19 (32nds).

STERLING £25,000 $ per £

	Close	High	Low	Prev
June	1.5058	1.5065	1.5000	1.5067
Sept	1.5043	1.5043	—	1.5052
Dec	—	—	—	—

Volume 341 (440)
Previous day's open int. 787 (784)

DEUTSCHE MARKS
DM 125,000 $ per DM

	Close	High	Low	Prev
June	0.4155	0.4163	0.4153	0.4189
Sept	0.4205	0.4210	0.4205	0.4222
Dec	—	—	—	—

Volume 110 (177)
Previous day's open int. 245 (388)

SWISS FRANCS
SwFr125,000 $ per SwFr

	Close	High	Low	Prev
June	0.4901	0.4904	0.4888	0.4929
Sept	0.4976	0.4976	0.4976	0.5004
Dec	—	—	—	—

Volume 105 (90)
Previous day's open int. 310 (314)

JAPANESE YEN Y12.5m $ per Y100

	Close	High	Low	Prev
June	0.4200	0.4217	0.4192	0.4226
Sept	0.4236	0.4236	0.4236	0.4262
Dec	—	—	—	—

Volume 48 (119)
Previous day's open int. 435 (408)

CHICAGO

U.S. TREASURY BONDS (CBT) 8%
$100,000 32nds of 100%

	Close	High	Low	Prev
June	77-00	77-07	76-29	77-04
Sept	76-14	76-21	76-13	76-19
Dec	75-31	76-06	75-28	76-04
March	75-18	75-25	75-17	75-23
June	75-07	75-13	75-07	75-12
Sept	74-29	75-03	74-29	75-02
Dec	74-23	74-24	74-21	74-26
March	74-14	74-17	74-14	74-18
June	—	—	—	—
Sept	—	—	—	—
Dec	—	—	—	—

U.S. TREASURY BILLS (IMM) $1m
points of 100%

	Close	High	Low	Prev
June	91.68	91.71	91.62	91.63
Sept	91.42	91.43	91.37	91.38
Dec	91.18	91.21	91.18	91.16
March	90.96	90.97	90.94	90.93
June	90.75	90.75	90.74	90.74
Sept	90.55	—	—	90.55
Dec	90.37	—	—	90.37
March	90.19	—	—	90.19

CERT. DEPOSIT (IMM) $1m points of 100%

	Close	High	Low	Prev
June	90.93	90.94	90.84	90.89
Sept	90.64	90.64	90.58	90.61
Dec	90.36	90.37	90.30	90.34

3-MONTH EURODOLLAR (IMM) $1m
points of 100%

	Close	High	Low	Prev
June	90.36	90.38	90.27	90.31
Sept	90.11	90.12	90.04	90.06
Dec	89.86	89.87	89.80	89.84
Feb	—	—	—	—
March	89.70	89.70	89.62	89.69

STERLING (IMM) $ per £

	Close	High	Low	Prev
June	1.5080	1.5175	1.4985	1.5060
Sept	1.5080	1.5115	1.4985	1.5045
Dec	1.5070	1.5110	1.4985	1.5036
March	1.5060	1.5110	1.4985	1.5136
June	—	—	—	—
Sept	—	—	—	—

GNMA (CBT) 8% $100,000 32nds of 100%

	Close	High	Low	Prev
June	70-11	70-15	70-07	70-12
Sept	69-16	69-19	69-14	69-17
Dec	68-25	68-29	68-24	68-25
March	68-05	68-10	68-05	—
June	67-21	67-22	67-19	67-20
Sept	67-07	67-07	67-05	67-05
Dec	66-27	—	—	66-24
March	—	—	—	—
June	—	—	—	—
Sept	—	—	—	—
Dec	—	—	—	—

WEEKLY CHANGE IN WORLD INTEREST RATES

	April 8	change		April 8	change
LONDON			**NEW YORK**		
Base rates	10½	Unch'd	Prime rates	10½	Unch'd
7 day interbank	10⅝-10⅞	+⅛	Federal funds	8⅞-9⅛	−9
3 mth interbank	10¼-10⅜	−½	3 mth Treasury Bills	8.32	−0.29
Treasury Bill Tender	9.8194	−0.3981	6 Mth. Treasury Bills	8.42	−0.24
Band 1 Bills	10⅛	Unch'd	3 Mth. CD ♦	8.90	−0.30
Band 2 Bills	10⅛	Unch'd	**FRANKFURT**		
Band 3 Bills	10⅜	Unch'd	Lombard*	5.00	Unch'd
3 Mth. Treasury Bills	10	−⅝	One Mth. Interbank	5.05	−0.125
1 Mth. Bank Bills	10⅛	−⅝	Three month	5.20	−0.10
3 Mth. Bank Bills	10	−⅝	**PARIS**		
TOKYO			Intervention Rate	12½	Unch'd
One month Bills	6.65625	−0.125	One Mth. Interbank	12⅝	+¼
Three month Bills	6.78125	−0.0625	Three month	12⅛	+⅛
BRUSSELS			**MILAN**		
One month	11⅛	−⅜	One month	18½	Unch'd
Three month	11⅛	−⅜	Three month	18⅛	Unch'd
AMSTERDAM			**DUBLIN**		
One month	4¾	+⅛	One month	10½	−1½
Three month	4⅞	+⅜	Three month	13½	+⅛

London—band 1 bills mature in up to 14 days, band 2 bills 15 to 33 days, and band 3 bills to 63 days. Rates quoted represent Bank of England buying or selling rates with the money market. In other centres rates are generally deposit rates in the domestic money market and their respective changes during the week. * Band 4 10⅝.

Authorised Units—continued

Equity & Law Un Tst Mngrs (a) (b) (c)
Amersham Rd, High Wycombe. 0494 33377
Euro St Ac 55.6 59.7 +0.3 1.17

Robert Fleming & Co Ltd
8 Crosby Square, EC3A 6AN. 01-283 2400
AmExFd* $247.84 253.42 .... 1.87
JpExFd* £125.75 133.99 .... 1.00
Next Subscription Day April 18, 1983
*Fleming American Property Unit Trust. Last issue price (15/12) US$10.176. Units are issued on Feb 15, May Aug Nov
*Fleming Property Unit Trust. Last issue price (25/3) £2,067. Units are issued on Mar 25, June 24, Sept 25 & Dec 25.
*Unauthorised.

Hexagon Services Ltd
4 Gt St Helens, London EC3P 3EP
0708 45322
AustFrsGw 102.9 108.4 .... 2.54
Brewin Cap 71.1 74.9 .... 1.35
Brewin Grinc 67.7 71.3 .... 3.76
CanGwthFd 91.6 97.3 .... 1.12

Lawson Fund Managers Ltd (a) (c) (g)
43 Charlotte Sq, Edinbgh 2. 031-225 6001
Aust & Pac* 7.1 7.7 .... 0.84
High Yield† 19.8 20.8 .... 6.75
Do Accum† 20.0 21.0 .... 10.75
* Dealing Thurs. † Dealing Fri.

MGM Unit Managers Ltd
MGM House, Heene Road, Worthing.
01-623 8211
High Inc 118.9 122.5xd +0.7 6.64
(Accm Uts) 115.6 124.3 +0.6 6.64
UK Growth 110.5 118.8xd +0.2 3.10
Accum Uts 110.7 119.0 +0.1 3.10

MLA Unit Trust Mngmnt Ltd
Old Queen Street, SW1A 9JG. 01-222 8576
MLA Units 164.4 172.5xd +0.3 2.90
MLA Intl — 25.0 .... 1.00

The Money Market Trust
53 Qn Victoria St. EC4N 4ST. 01-236 0952
Call Fund — — 10.91
7 Day Fund — — 10.67
† Unauthorised—Sterling Deposit Fund

Insurances—continued

Albany Life Assurance Co Ltd
3 Darkes Lane, Potters Bar. 0707 42311
Pension Funds
EqPenFdAc 560.2 589.6 +1.1 —
Fix I Pen Ac 400.0 421.6 .... —
GtdMnPenAc 235.6 247.9 +0.1 —
IntlMnPcAc 227.5 239.4 +1.3 —
NAmPFdAc 116.8 122.9 −0.2 —
Prop Pen Ac 212.2 223.4 .... —
MpliInvPnAc 475.3 500.3 +1.3 —

Commercial Union Group
St Helen's, 1 Undershaft, EC3. 01-283 7500
VarblAcApr 9 — 133.44 +1.84 —
An Uts Apr 15 — 30.92 +0.27 —
Prime Series
Managed 103.2 105.7 +0.2 —
UK Equity 105.0 110.6 +0.5 —
Intl Equity 101.9 107.3 +0.2 —
Property 96.9 102.0 .... —
Fixed Int 102.1 107.5 .... —
Indx Lnkd Gt 95.1 100.2 .... —
Cash 96.0 101.1 .... —
Hand-in-Hand
Cash 117.8 123.8 .... —
Fixed Int 135.5 142.7 .... —
Property 134.7 141.0 .... —
NatWest 169.0 177.9 .... —

Henderson Administration
11 Austin Friars, London EC2. 01-588 3622
High Inc Fd 135.5 142.5 +1.0 —
Gilt Edg Fd 99.8 104.9 +0.7 —
Co Gwth Fd 139.1 145.5 +0.9 —
Technology 149.5 157.4 +1.7 —
Nat Res'ces 115.9 122.0 +1.2 —
Spec Sits Fd 177.7 187.1 +1.5 —
N Amer Fd 207.1 218.1 +3.4 —
Far East Fd 154.4 162.5 −0.1 —
Prop Fd 113.5 119.5 +0.6 —
Managed Fd 173.0 182.2 +1.8 —
Far S Ps Ac 102.6 108.1 −1.1 —
Deposit Fd 114.3 120.4 +0.6 —
Prime Rs Rp 110.2 116.1 +1.2 —
UK Eqp Ac 98.7 103.9 +1.7 —
FxdIntPsAc 104.2 109.7 +2.5 —

N Am Ps Ac 103.2 108.7 +1.6 —
SpSitPenAc 104.7 110.3 +1.5 —
ManPenAc 101.8 107.2 +2.2 —
ComFoPenAc 96.5 101.6 +0.4 —
PmRsPoPsAc 96.4 101.5 +0.4 —
Dep Pen Ac 96.5 101.5 +0.4 —
Capital Unit Prices available on request.

Save & Prosper Group
4 Gt St Helens, London EC3P 3EP.
0708-66966
Gilt Pen Fd 179.8 190.4 −0.2 —
Dep Pen Fd† 178.5 188.9 +0.4 —
Gt Eq Pen Fd 49.6 52.5 +0.3 —

Skandia Life Assurance Co Ltd
Frobisher Hse, Southampton. 0703 334411
Managed 147.4 155.2 .... —
Equity 180.5 188.9 .... —
Internat 165.1 174.8 .... —
Nth Amer 101.7 107.0 .... —
Gilt Plus 136.1 143.3 .... —
Property 125.8 132.2 .... —
Deposit 127.6 134.3 .... —
Pens Mangd 173.9 183.0 .... —
Pens Equity 186.1 195.9 .... —
Pens Intl 196.1 206.4 .... —
Pens Gilt Pls 161.2 169.7 .... —
Pens Prpty 150.3 158.2 .... —
Pens Depost 153.0 161.1 .... —
For prices of Capital Units and Guaranteed Basic Rates please phone 0703 334411.

Target Life Assurance Co Ltd
Target House, Gatehouse Road, Aylesbury, Bucks. Aylesbury (0296) 5941
U.S. Dollar — — 5.50
Swiss Franc — — 1.40
Deutsche Mark — — 2.00
Yen — — 1.80

TSB Life Ltd
PO Box 3, Keens House, Andover, Hants. SP10 1PG.
Managed Fd 97.1 102.3 +0.2 —
Property Fd 95.3 100.4 −0.1 —
Fixed Int Fd 97.1 102.3 .... —
Money Fund 95.3 100.4 .... —
Equity Fund 97.3 103.1 +0.4 —

Offshore and Overseas—continued

CAL Investments (IoM) Limited
16 St Georges St Douglas IoM. 0624 25031
CAL Cm&C 98.1 103.3 .... 4.47
CAL Metal 94.2 99.2 .... —
Dealing days every Monday.

CAL Investments (Bermuda) Limited
PO Box 1022, Hamilton, Bermuda
CAL CTR Fd. 98.0 105.0 .... —
Dealing days every Monday.

Manufacturers Hanover Asset Mgt
PO Box 92, St Peter Port, Guernsey.
0481 23961
GldLqAs$ $104.27 104.48 +0.20 9.29
GldLAA$ $120.05 120.30 +0.30 13.85
GldMinc $115.16 115.74 +1.45 6.12
GldMAc$ $126.99 127.64 +1.59 23.70

Norcap Fund Managers (Bermuda) Ltd
Sk. of Bermuda Bldg., Bermuda.
809 29 5400
NorcpAmT $10.90 11.25 .... —

Perpetual U.T. Managers (Jersey) Ltd
PO Box 459, St Helier, Jersey. 0534 74517
Offsh Gwth $1.021 1.086 .... 2.00

Rea Brothers (Isle of Man) Ltd
29 Athol St., Douglas, IoM. 0624 21724
Bond Fund £1.15 1.225xd 9.13

Rothschild Asset Management (C.I.)
St Julian's Ct, St Peter Pt, Guernsey.
0481 26741
OC International Reserves Ltd
Bel Frs BFr831.85 +0.05 10.86
Canadian $ C$35.70 +0.015 7.78
D-Mark DM50.09 +0.010 3.95
Dutch Guilder Fls49.80 +0.05 3.13
French Frs FFr136.52 +0.045 11.14
Italian Lire L34,987 +5 15.12
Japanese Yen Y6,153.13 +0.95 5.73
Singapore $ S$62.135 +0.015 8.52
£ Sterling £13.886 +0.004 9.82
Swiss Francs SwFr49.277 +0.002 3.18
U.S. $ $28.495 +0.005 8.36
Daily dealings.
For other Rothschild Offshore Funds see Offshore and Overseas section.

SCI/Tech SA
2, Boulevard Royal, Luxembourg
SciTech SA — $10.01 −0.01 —

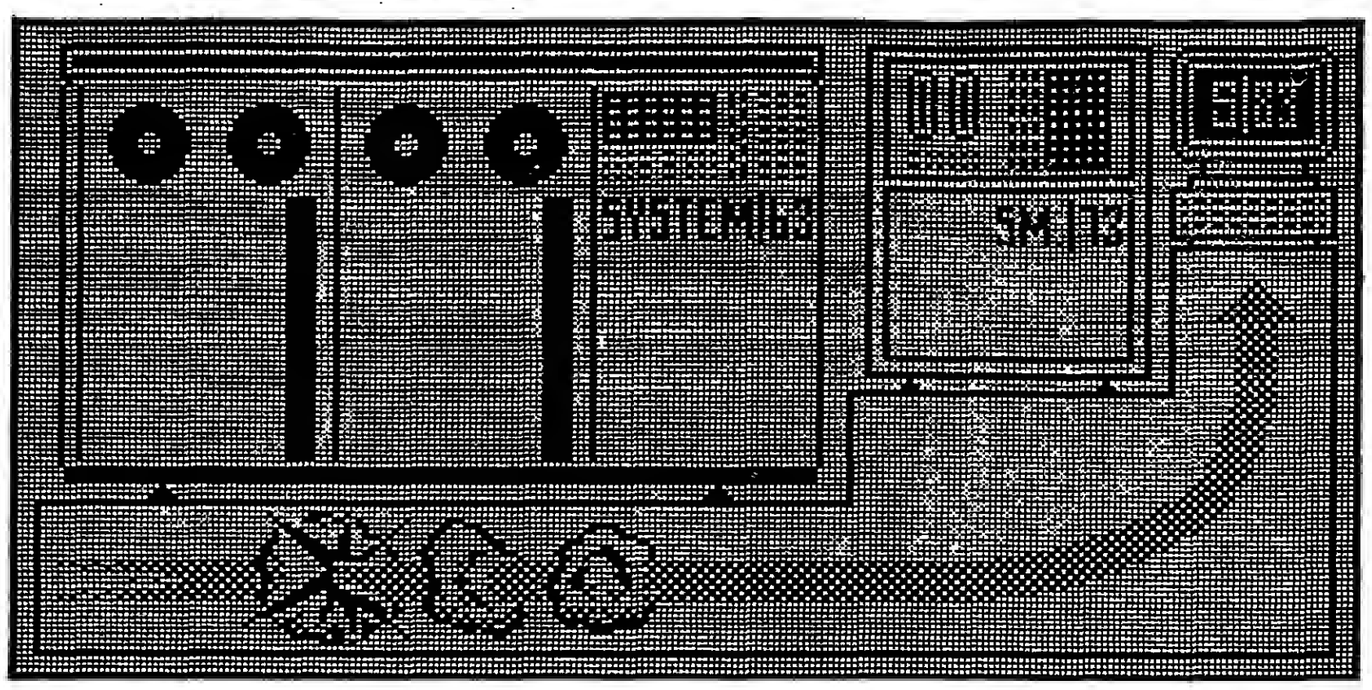
Schroder Mngt Services (Jersey) Ltd
PO Box 195, St Helier, Jersey. 0534 27561
Schroder Money Funds Ltd.
Sterling £13.5544 .... —
U.S. Dollar US$25.4218 .... —
D-Mark DM50.4455 .... —
Swiss Franc SFr50.2057 .... —

Tyndall-Guardian Management Ltd
PO Box 1256, Hamilton, Bermuda
T-G Am $22.07 — .... —
T-G Money $20.69 — .... —
T-G E'bond $15.42 — .... —
T-G Com $22.02 — .... —
T-G Mort C$18.92 — .... —
T-G O'seas $10.97 — .... —
T-G Pacific Y1.775 — .... —
T-G Wall St. $23 — .... —

FINANCIAL TIMES SURVEY

COMPUTERS IN BUSINESS

Big changes are sweeping the computer world. The boom in microcomputers, highlights the growing demand for computer power at the elbows of the people who need it—and in a form that they can use easily. The shift towards more comprehensive, integrated software underlines the apparently inexhaustible demand for raw computing power.



Graphic by Michael Daley

The industry

THE COMPUTER industry has ridden the recession well, its customers displaying an apparently inexhaustible appetite for data processing power. But it has lost its traditional clarity as more and more powerful silicon chips have blurred the distinctions between big and small computers. First, there was the "supermini," now the "supermicro" and the "micromainframe."

IBM, the industry leader, steamed ahead both in profits and revenues while some other companies including Digital Equipment, the world leader in minis, slowed or faltered.

Apple Computer, leading the microcomputer pack, launched an innovative new machine to protect its flanks against IBM and the other electronics majors' incursions into the personal computer market, as Margaret Coffey reports.

Alan Cane profiles Wang, the billion dollar office automation and word processing company which sailed through the recession, growing on average by 58 per cent a year.

The customers

THE DATA processing centre is the engine room of modern business, but it powers a variety of different business vessels from pharmaceuticals to automobiles.

Here Financial Times industry specialists look at the way computers are used in their areas: in manufacturing industry, Geoffrey Charlish reports that "it is only a matter of time before the automatic factory becomes a reality," Lynton McLain studies the transport and distribution of freight—"one of the most costly and potentially inefficient operations that management has to tackle."

The chemicals industry, covered by William Dawkins shows data processing maturity: "We are talking about the value of information rather than saving on clerks."

John Griffiths finds that, in the motor business, "computers have fast been taking over every aspect of the car" while David Churchill finds wholesalers "a natural market for computerised methods.

Systems

THIS SECTION investigates the way computers are being used in a number of different types of organisation.

Jason Crisp went to Glaxo Pharmaceuticals where 500 terminals, distributed up and down the country and powered by 16 Hewlett Packard minicomputers, make 14 sites seem like one. Tim Dickson talked to Martin the Newsagent which has designed and built its own "paper tiger"—a micro for its own branches which it will market to other newsagents.

Raymond Snoddy investigated the way the British Distribution Company made use of its CTL mini. "Without the computer system we would have needed 200-250 extra people costing £250,000 a year," its managing director claimed.

Arnold Kransdorf looked at the Trustee Savings Bank Group's computer services which uses two bureaux in addition to its own central computing facilities—the first large-scale branch bank enterprise in the UK to use on-line real time systems.

International

COMPUTERISATION is a world-wide phenomenon, yet each country has its own approach. In this section, Financial Times foreign correspondents look at developments in computerisation in four of the major electronics nations and in the Soviet bloc.

Louise Kehoe reports from the U.S., where American manufacturers are determined to maintain their lead in world data processing markets.

Roy Garner reports that Japan is only now beginning to find automation potentially threatening, while in Paris, David Marsh examines progress in *l'informatique*.

From Moscow, Anthony Robinson lifts the Iron Curtain on Russia's efforts to keep abreast of Western computer technology, while in the UK, Joan Gray reports: "Micromania swept Britain last year and shows no signs of abating."

The technology

INDUSTRY SPECIALISTS report on and assess the way computer technology is changing—and changing business. Richard Sharpe discusses the hardware, the physical computers themselves, while Philip Manchester writes about software, the sets of instructions needed to run the machines and their applications.

Elaine Williams discusses networking—ways of tying together computers and peripherals like printers and electronic files. Rex Winsbury looks at the progress of viewdata, the electronic link between television set and computer memory.

Terence Westgate predicts the coming of integrated subscriber data networks—telephone services for the 1990s and discusses some of the likely obstacles to their implementation — chief among which seems to be a lack of world-wide standards.

The big issues

WITHOUT DOUBT the major issue facing the data processing world is the trial of strength between IBM and AT&T in the computing, datacommunications and telecommunications markets. Guy de Jonquieres looks at an IBM freed from legal action, and an AT&T in the process of restructuring.

The Orbit study weighed the UK in the balance for fitness for the electronic office revolution and found it wanting. Its detailed conclusions are presented in this section along with articles on new ways to make computer information available to managers, the developments of systems that "reason" for themselves.

John Lloyd discusses the unions and computerisation.

● *Editorial production of this survey was by Mike Wiltshire. Design by Philip Hunt.*

Despite the world recession, the computer industry has shown strong, if patchy growth. The major phenomenon of the past two years has been the dramatic rise of the microcomputer, as **Alan Cane** reports here

'Quiet centre of the hurricane'

THESE PAST few years will be seen in retrospect as the quiet centre of the information technology hurricane.

Despite the worst recession for 50 years, the computer industry, which existed only in rudimentary form in the 1930s, has continued to show strong, if patchy, growth.

If the world economy is truly on the up-turn, as economic indicators now suggest, the business world will be swept by a high tide of intelligent electronics which threatens to displace traditional methods and values while setting in their place new engines of growth for industry and commerce.

Without doubt, the major phenomenon of the past two years has been the emergence of the microcomputer from cupboards labelled "hobbies" and "executive toys" to take what many now believe to be its rightful place on the manager's desk.

Apple, Commodore and Tandy believed that from the beginning. They have since been joined by a host of the larger electronics manufacturers including Digital Equipment, Hewlett Packard, Philips, Olivetti, Burroughs, ICL and Wang.

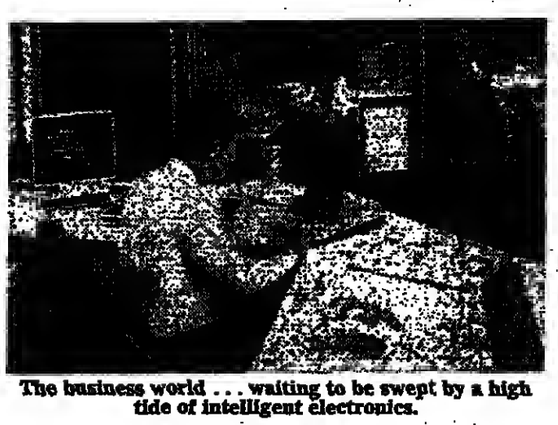
Most significant of all, IBM the colossus of the computer business, made it clear it believed in a future for the professional personal computer with the launch of its own machine first in the U.S. and now in Europe.

Only two weeks ago, IBM Japan announced the launch of what it described as a "multi-function" workstation with the capacity to combine word processing and data processing and to be built for it by the Japanese electronics giant Matsushita.

But the dramatic rise of the microcomputer is only a symptom of what is happening to the computer industry, not the cause.

The major trend is towards computer power at the elbows of the people who need it most and in such a form that they can use it easily.

That power may be provided by a stand-alone personal computer although this is likely to be found only in the smallest organisations. What is much more likely is linked networks of mainframe computers, small computers, personal computers and computer terminals giving common assess to resources, such as information and utilities like printers and facsimile machines.



The business world . . . waiting to be swept by a high tide of intelligent electronics.

Which is why an organisation like International Data Corporation (IDC) forecast substantial increases for all processor markets through 1986.

IDC points out that: "Users continue to show an almost insatiable desire for processing power."

It was good news for IBM which reported a 22 per cent increase in net earnings for 1982 to reach $4.4bn on revenues of $34.36bn effectively crushing whispers that "Big Blue" was past it, after several years when the other mainframe vendors, Burroughs, Univac, NCR, CDC and Honeywell, were growing faster than the giant.

Some of IBM's competitors found the pace too strong. After some years of financial and managerial problems, Magnuson, a leading plug compatible manufacturer, threw in the towel and filed for protection under Section 11 of the U.S. bankruptcy code.

Its president, Mr. Charles Strauch, said last month that the company had been trying to restructure itself. "We were well on our way towards achieving this goal early last fall but IBM's October 1982 pricing and product announcement had a very negative effect on the pricing of our product line."

The major trend is towards computer power at the elbows of the people who need it most.

PCMs manufacture computers which behave as if they were IBM computers to the extent of running IBM software and software written specially for customers to run on IBM computers.

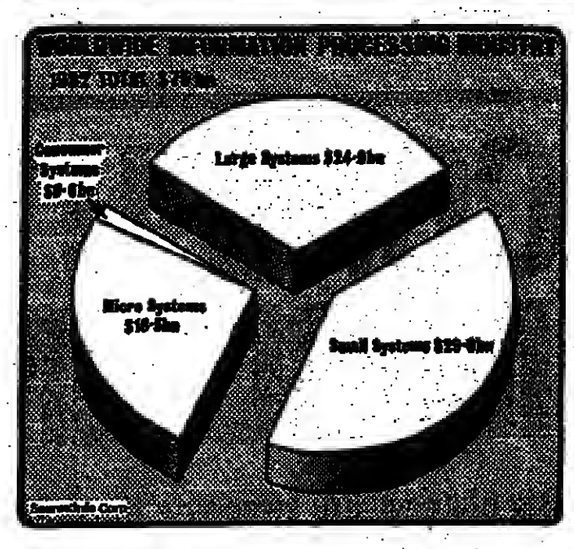
By taking advantage of the most advanced technology and innovative design, PCMs hoped to undercut IBM on hardware prices while avoiding the massive costs of developing operating software — the programs which run the computer itself — from scratch.

In theory, it looked good and companies like Amdahl and Itel (whose computer operations were later taken over by National Semiconductor as National Advanced Systems) looked like winners in the late 1970s.

Meanwhile, IBM was spending phenomenal sums on automating its production lines to the point where most industry observers believe that no other computer company can match the giant on manufacturing costs.

IDC points out: "The PCMs are dealing with a more aggressive IBM. Price pressure and a stepped up pace of product introductions has presented the competition with a moving target."

It notes IBM's extensive use of microcode — special software instructions placed so as to make use of IBM software difficult or impossible and concludes: "With the forthcoming extended architecture and the complications of IBM's dynamic channels and big machine input/output complex, it is no wonder that the Japanese PCMs Hitachi and Fujitsu greatly prefer to offer their own operating system software with their machines."



ICL now offers a large (15m instructions per second) Fujitsu machine as its top of the line "Atlas" computer.

NAS recently closed its San Diego manufacturing facility and now sells only Japanese computers built by Hitachi.

But even the biggest computer companies are finding that the new shape of the data processing business presents them with unexpected and awkward problems. IBM's reputation, for example, is built on a thorough marketing approach, first rate salesmanship and a customers support and back-up service that is second to none.

All that is fine when you are selling computers at £1.5m a time; it is even possible when you are selling minicomputers at £100,000 a time—but it is a hopelessly uneconomic approach when you are selling microcomputers and the whole package of hardware and software is worth less than £5,000.

It affects both big and small companies — the majors with massive marketing muscle they cannot afford to apply to tiny systems and the small systems houses with little idea of what marketing is all about.

Hence the move by the IBM's DEC's and Xerox's towards high street computer stores and the use of retail outlets by companies which had traditionally only marketed directly.

The minicomputer manufacturers have long used systems houses as sales outlets — companies like Digital (DEC) Data General or Prime offer their hardware to systems houses on an OEM (original equipment manufacturer) basis.

DEC, the world leader in minicomputers, is having a lean time of it now. After nine years of spectacular, uninterrupted growth, net earnings for the half year ended January 1 were over 37 per cent down on the equivalent 1981 figure of $187.9m, while six month revenues totalled $1.94bn against $1.8bn.

Minimakers who showed strong and sustained growth were those with the strongest market niche including Wang, an office automation specialist with a powerful reputation in word processing (see page xxx) and Tandem, first of the manufacturers to offer "non-stop" computing.

The success of both Wang and Tandem — both of which sell equipment which is noted both for its quality and for its high price tag—indicates the premium which customers place on reliability. The banks are some of Tandem's best customers — Tandem Nonstop machines will be used for the London clearing banks Chaps city clearing system—because of the value they place on computers which will not let them and their customers down.

It is becoming increasingly clear, however, that the stakes for remaining in the computer business are high—in fact, for almost everybody, too high.

Justifying IBM's new willingness to enter into joint ventures, Mr Eddie Nixon, managing director of IBM (UK) said: "Perhaps we are less arrogant, more humble, than we used to be. Big as we are, we cannot do everything."

The computer business these days covers everything from chip design and manufacture to applications programs for specific customers.

One thing is certain. The video screen on the desk is here to stay—even in Russia.

IBM, with its vowed aim of covering the waterfront, has greater problems than most. Its joint agreements and ventures include buying a share of Intel, the innovative Silicon Valley semiconductor house, agreement with Matsushita (which has already led to the multifunction work station) and an agreement with Peachtree, a software subsidiary of Management Sciences America (MSA) a major computer bureau to develop software for the Personal Computer.

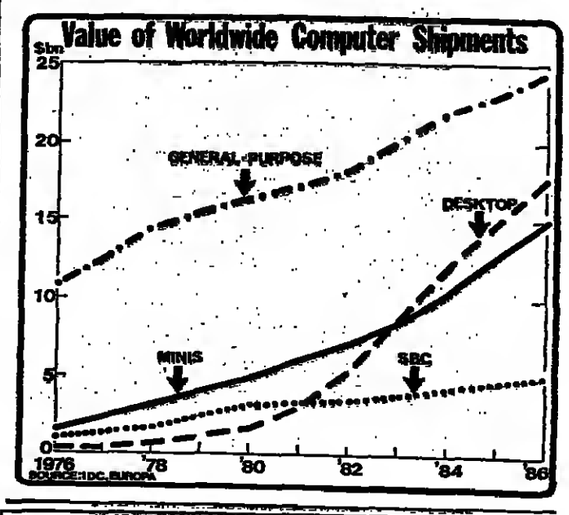
Even for IBM, largest manufacturer of silicon chips in the world, the development costs of a 64,000 bit read-and write memory chip to equal or better the Intel product, was, it seems, too high.

Earlier this year, Cii Honeywell Bull, the state-controlled French computer group which has been making heavy losses, attributed at least some of its troubles to the cost of staying in the world class high technology game.

And at the end of last month, the company in conjunction with Siemens of West Germany and the UK's ICL announced they were thinking of setting up a joint centre to undertake long term research on advanced computing systems.

Business customers, for their part, worry about managing a world whose traditional axes have shifted considerably. The line between telecommunications and data processing has become blurred — and both the industry and its customers await the outcome of the impending battle between IBM and AT&T with renewed interest.

Only one thing is certain. The video screen on the desk is here to stay — even in Russia. The first of the Russian Personal Computers — unashamedly modelled on the Apple II — are already rolling off the production lines in Zelenograd, near Moscow. They call it "Agatha".



COMPUTERS IN BUSINESS III

Dramatic fall in prices as microcomputer sales soar to new records

The year of the micro

THIS YEAR could well go down in technological history as the year that personal computers became truly personal. Business took to microcomputers in greater numbers than ever before and for the first time, large numbers of individuals bought them for their personal use. Microcomputers took a giant step out of the toy cupboard and began to be widely perceived as tools.

The figures leave no doubt that these small computers are big business. Sales of microcomputers in the UK alone last year grew by 100 per cent to reach a value of £375m. Much of this boom came about because technological advances allowed prices to fall dramatically.

As prices continue to drop in future and manufacturers increase their efforts to make these machines easier to use, more and more people in all areas will find that they can afford a personal computer.

As the name implies, microcomputers are the smallest of computers. They range in price from just over £50 to about £10,000, depending on their power and complexity. They work on the same principles as their larger predecessors, the mainframes and minicomputers, and perform scaled-down versions of the same functions. Unlike the larger machines, they are designed to be used by non-technical individuals.

At the moment those individuals tend to break down into roughly three categories: business, home/hobby and education. Of these the largest, in terms of value, is business. Last year 100,000 business microcomputers worth £285m were sold in the UK, according to a report by International Resource Development, a U.S. market research firm. By contrast only £90m worth of home/hobby machines were sold.

The difference between the two categories is, of course, the prices of the machines involved. The average business machine in the IRD study cost £2,500; the average home / hobby computer £200.

Three U.S. companies tend to dominate the UK market for business microcomputers according to the latest study on the micromarket from Key Note Publications. Commodore Business Machines, Apple Computer and Tandy Corp account for the majority of the business micros now installed in the UK. They will face strong competition this year from a number of companies, including International Business Machines, which has recently introduced its bestselling Personal Computer into the UK market, from Digital Equipment Corp and ACT Sirius, a UK company that is marketing Sirius business machines in the UK.

These machines are being put to a variety of uses in business. In small companies they tend to perform the same functions, once done manually, that larger computers do in larger firms.

> There is no end in sight to the boom in microcomputers.

So they are used for accounts, stock control, and word processing among other things.

In larger organisations the uses can be even more varied. With the proliferation of spreadsheet programs that began with VisiCalc personal computers have become the favoured tool of many managers. These programs allow professionals to do complex forecasts very quickly by making it possible to see what will happen each time one variable is changed.

Companies such as Apple, which has just introduced the Lisa, an expensive micro aimed directly at the executive, are working hard to ensure that personal computers appeal to top personnel. At the moment the manager, or decision maker is a key target. The idea is to turn a computer into a kind of electronic desk so that anything a manager can do with telephone, pen and pad can be done nearly as easily and more quickly, with a personal computer.

Larger organisations have also begun to use microcomputers for fairly mundane tasks. Secretarial, clerical and junior staff are now using the machines for routine jobs such as stock control, pay roll, bought and sales ledger and word processing.

But the numbers of machines bought for business in the UK last year pales in comparison to those bought for use in the home. Of the 495,000 micros shipped here last year, 395,000 went into homes.

Many of the major suppliers of these machines were UK companies. Sinclair, the firm that gave the impetus to the home market when it introduced the ZX 81 for £99.95 in 1981, was selling 20,000 ZX 81s per month, according to the Key Note report.

Acorn, the manufacturer of the BBC, claims to have sold 50,000 machines last year and now claims a rate of 8,000 per month. U.S. company Commodore claimed to have sold 40,000 of its Vic 20s in the UK in the first six months of 1982 alone.

The profile of the people buying these low-priced machines has changed sharply since microcomputers first made their appearance in 1978-79. Then the buyers were typically enthusiasts, teenagers and adults with a technical bent who wanted to put a computer together and then take it apart again in the same way as many motor enthusiasts do.

Now it has become much more of a family affair. Many buyers are people with children and they are buying the machines for a variety of reasons. Some want their children to understand computers and buy micros so that they can learn how to programme and use them. Some want to learn how to use computers themselves in order to keep household accounts etc. Whatever reason many people find for buying the machines there seems little doubt that many of them are used to play games of the "Space Invader" and "Dungeon and Dragon" variety.

Much the same thing is happening in the U.S., the breeding ground of the microcomputer revolution. There, too, falling prices have given a tremendous boost to the home computer market. Entertainment played an even greater part because of a craze for video games. When prices dropped so far that there was little difference between buying a video game to use with the television and buying a computer, the market exploded.

"It took off last fall," explained Mr Egil Juliussen, a consultant with Future Computing, a Texas firm that follows the U.S. micro market. "Sales increased by a factor of 10 in just four or five months."

In the U.S. this year sales of 5m home computers worth $2bn are expected, while sales of 1.5m microcomputers designed for business worth $5.7bn are forecast.

In the home market the leading companies are similar in the UK and U.S. Sinclair and Commodore both have major shares of the market. Texas Instruments is also a dominant supplier in the U.S. since the release of its 99/4A machine. The company has just launched that model in the UK and so could be a major supplier here as well by this time next year.

Apple shows up as a leader in the business market in both countries. But in the U.S. IBM has captured 19 per cent of the market for machines priced between $1,000 and $5,000 in the past year alone.

The educational market is a ripe field in the UK because of the Government's scheme to encourage the use of computers in schools. Key Note puts the value of this market at £15m per year. Until the end of 1981 Research Machines led this field with its 3802, but now Acorn claims that some half of the micros in schools are BBCs. Other machines in this market include Sinclairs, Dragon 32s, Apples and Pets.

Despite sceptical forecasts there is no indication that there is any end in sight to the boom in microcomputers. Sales in the UK are expected to continue to grow by 100 per cent per year through 1985.

By the end of the decade the market for business machines could be worth anywhere from £2bn to £4bn. Although the numbers of home computers sold will continue to rise, the value of that market could drop to £350m in the early 1990s.

As the technology makes these machines more powerful at less cost, and manufacturers and software suppliers concentrate on making them easier to use, micros will move even further out of the realms of the specialist and into the mainstream. In fact, the answer to the question who is using these machines and for what, is soon likely to be: almost anyone for nearly anything.

Margaret Coffey

The author is editor of Micro-Decision.

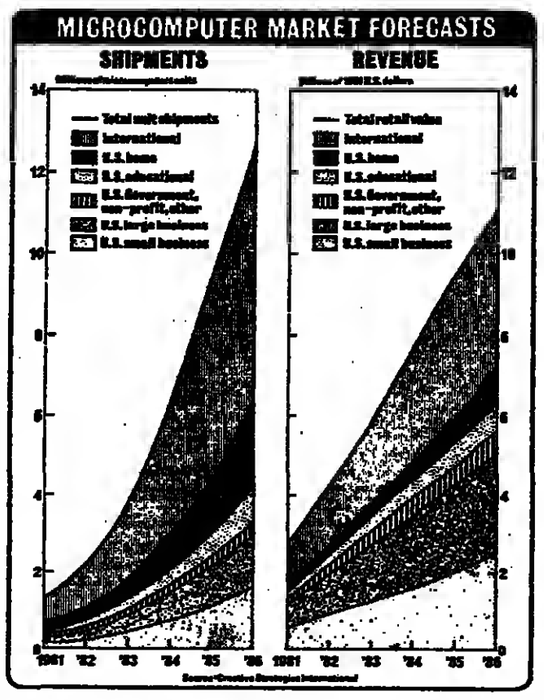
TYPICAL PRICES

Examples of typical small (and very small) business computer systems and their prices

CSI group	Maker and model	Typical price
GROUP I	Apple II	$1,750-6,500
	Commodore 8000 Series	$3,100-5,300
	Commodore 4000 Series	$2,800-3,700
	Tandy TRS-80 Model II	$4,100
	Olympia Boss	$5,500
GROUP IIa	Sirius I	$5,500+
	Olivetti M20	$5,000
	Apple III	$5,300+
GROUP IIb	DDC Profi 203	$8,500+
	Nixdorf 8820/2	$12,000+
	Kontron PSI8000	$15,500+
GROUP III	Nixdorf 8870/1—Model 10	$22,000
	IBM System 34	$20,500+
	Digital PDP 11/23	$33,000+
	Kienzle 9066-10	$23,500
	Olivetti S6000	$40,000
GROUP IV	IBM System 34 (P36)	$91,000
	Digital PDP 11/24	$46,000+
	Philips P4530	$54,000
	Nixdorf 8870/8	$100,000

Note: Conversion rate used: $1=DM 2.25. For example, Italian VSBC customers hardly ever pay list prices for their systems, while interest rates and payment difficulties affect the real price received by the vendor.

Source: Creative Strategies International and Computer Consulting GmbH.



Very Small Business Computers

Western European Market: 1981-86

Year	Units sold	Market value ($000)
1981	160,000	1,250,000
1982	225,000	1,500,000
1983	315,000	1,775,000
1984	440,000	2,100,000
1985	615,000	2,500,000
1986	860,000	3,000,000
Compound annual growth rate	40.0%	19.1%

Source: Creative Strategies International

Mainframe sector under new pressure

A CLICHE to avoid, as they say, like the plague is to describe a new microcomputer as "having the power of a mainframe." Certainly, today's small computers are powerful, but their power is equivalent to that of mainframes of long ago—and two years is a long time in data processing.

NCR, the U.S.-based computer manufacturer announced last month a tiny computer based on the company's very advanced 32-bit processor chip (32-bit refers to the number of binary digits equivalent to 0 or 1 that the computer processes simultaneously—the larger the number of bits, the faster the processing speed should be).

"We call it a mainframe," an NCR spokesman said. "It is two cubic feet in volume, and weighs 50 pounds. You can put it on your desk or hang it on the wall."

Such a machine, supporting as it does up to 4m words of immediate memory and over 40 terminals, would undoubtedly have been a mainframe two years ago.

Top of the NCR range, the V-8600 family, handles 16m words of immediate memory and would certainly be able to handle over 300 terminals all running simultaneously on a typical commercial job mix.

So microelectronics is driving up performance for computers of all sizes—and the computer industry is still only beginning to use very large scale integration (VLSI) in its machinery. With a million or more features on a chip made possible in just a few years, computing power of a previously unattainable order will become commonplace.

But will the manufacturers find customers for these super powerful machines?

The fastest available commercial computers, made by companies such as Cray Research, Control Data and Nippon Electric find homes in specialist areas such as meteorological research, oil prospecting and scientific research.

They are bought in very small numbers by companies to whom price is no obstacle; assuming a computer with the power of a Cray could be realised in a package the size of one of today's microcomputers, would there be a market for it in business.

The world mainframe market is, after all, fairly depressed. The International Data Corporation (IDC) noted recently: "Neither 1981 nor 1982 will be remembered as great years in the mainframe industry.

"In 1981, the value of general purpose shipments was up just 4 per cent over 1980, although units were up 8 per cent."

It went on to predict that the overall value of shipments in 1982 would be up 6 per cent over 1981, chiefly through strong shipments of the first of the new family of IBM big computers, the 3081.

> The continued need for centralised computing power means that the dinosaur will survive—and evolve.

It proved an accurate prophesy. Shipments of mainframe computers rose by 6 per cent in 1982 over 1981—but shipments of distributed systems—linked minicomputers—rose by around 30 per cent and office automation equipment by 36 per cent.

IDC goes on to say: "Pent up demand for mips (millions of instructions a second) has put IBM in the enviable position of being able to ship all the big systems it can build and IBM says it is making more than ever it expected."

IBM had to carry the ball alone in 1982, it argued, and indeed 1983 has been marked by a spate of announcements from the BUNCH (Burroughs, Univac, NCR, CDC, Honeywell).

Burroughs announced a new top-of-the-range machine, the 7900, an object lesson in ways of distributing processing power.

What Burroughs, and other big mainframe manufacturers, do these days to to divide the functions of the machine between a number of microcomputers—they, in fact, create a distibuted processing system within a single cabinet.

The Burroughs machine can achieve up to 100,000 transactions an hour through off-

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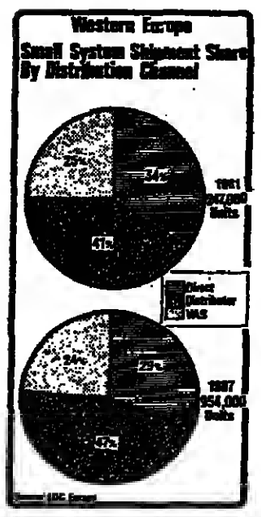
The minicomputer is alive and healthy, reports **Ray Snoddy,** but competition is intensifying

Challenge of the middle ground



MUCH OF THE glamour and publicity—and many of the personalities—may have shifted to the home computer but the mini computer, though showing some signs of early middle age, is alive and healthy. It is even promising sustained and in some areas exciting growth.

Led by the superminis, the 32-bit mainframe equivalents, the overall value of worldwide minicomputer shipments by U.S. manufacturers are expected to grow at a compound rate of 20 per cent a year over the period 1981-1986 and rise in value from $6.2bn to $15.4bn.

But within the overall expansion the rate of change in an already fast moving market is accelerating and the competition is becoming more intense. Not every mini manufacturer may survive the course to the end of the decade.

Even dictionaries of information technology published this year still confidently define a minicomputer "as a computer of intermediate size and computing power between a mainframe and a microcomputer." In reality the old distinctions between micro, mini and mainframe computers have become increasingly blurred.

Mr Bill Passmore, marketing manager in the UK for Digital Equipment Company (DEC), the company which created the mini and is still the market leader, says he simply does not know any more what a mini is.

At the lower end the distinction has lost much of its meaning as super micros, professional personal computers and small minis overlap in the fight for the same market. At the upper end of the range the super 32-bit minis are taking on the central mainframes as never before and catching the customers migrating downwards as the centre of gravity shifts away from the large general purpose machines.

DEC prefers to be known as "the world's largest small computer company" rather than the number one mini manufacturer and the changes in computing power in its product range demonstrate how the old distinctions have lost their clarity as computing power has dramatically increased with falling prices.

> ❛ In reality the old distinctions between micro, mini and mainframe computers have become increasingly blurred. ❜

When he first joined DEC in 1970 Bill Passmore was selling a PDP mini—DEC's basic mini workhorse which in updated versions is still going strong—for about £60,000.

A chip four times faster is now available for several hundred pounds for use in other products such as robots or in industrial control.

The same PDP chip can be found in the new DEC professional personal computer which began arriving in the UK in bulk for the first time last month.

At the upper end of the market DEC plans to launch later this year linker clusters of its VAX superminis which, it believes, will more cheaply and flexibly handle as many millions of instructions per second (MIPS) as all but the most powerful main-frame computers used for large-scale modelling.

Although there will probably still be real growth for the traditional medium - strength medium-priced mini it is on either flank of the mini market where the most dramatic growth is likely to take place.

International Data Corporation (IDC) in a recent study of the West European market for minicomputers noted that the dynamics of the market showed some contrasting fortunes.

"Both the supermini and the micromini are destined for the most dramatic growths—estimated on an average annual basis to be 25 per cent and 29 per cent respectively. By comparison, the average growth of 7 per cent in the traditional minicomputer revenue seems pedestrian, although during 1986 the market will still be worth an estimated $960m." This compares with an estimated $5.2bn for the total West European market in that year.

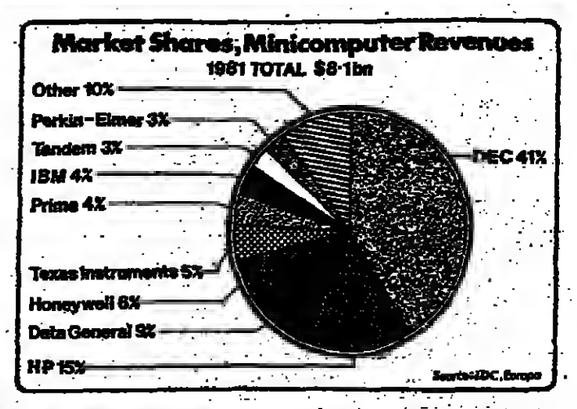
IDC says that the undisputed market leader in Western Europe is DEC, with over 25 per cent of revenues generated, and is in first or second position in all countries.

Pole position goes to Siemens in West Germany, SEMS in France, and HISI in Italy.

But although DEC is the clear leader and believes it has read the market right, the process has not been effortless. In the quarter ending January 1 this year total revenue was just over $1bn, but pre-tax profits slumped from $165m to $98m. There has also been a pay rise deferment for six months.

The company says the fall in profit was partly due to recession but mostly caused by increased advertising and research and development spending.

DEC now believes it has the machines to protect its flanks as the expected slow decline of its middle range as a proportion of total sales continues.



For many applications — particularly banking — the PDP family is more cost-effective than the VAX. Last month Barclays Bank ordered 150 PDP IIs and it is planned to install similar systems in up to 500 branches over the next two years.

For some companies there is a danger of becoming more isolated in the shrinking middle ground. Data General (DG), third in the mini market, with sales of $900m in the year to October 1982, admits that it was slow to read the coming changes.

"But that was three years ago. We now have the fastest 32-bit system," says Mr Bill Cadogan, Data General's marketing manager for the UK and Ireland.

The company believes it has come from behind to steal the lead in one of the most significant mini races—the contest to put "mainframe" computing power in an easily accessible form on the desk of engineers, scientists or managers.

Earlier this year DG announced the arrival of the "megamini"—the Eclipse MV/1000, which it claimed "offered the highest performance of any virtual memory 32 bit computer available."

The machine was said to be twice as fast as the company's one previous largest machine and only 20 per cent more expensive.

Prime, with a good reputation in providing minis for science and government, was another company in danger of being outflanked at both ends of its market.

Late last month it signed an agreement with Convergent Technology of California to purchase and jointly develop intelligent work stations.

The scale of the coming competition can be gauged from the fact that Hewlett Packard, Number two in the mini market, has also weighed in with its own supermini, which it says will deliver "mainframe" power to the desk top for £20,000.

The company, which is also well positioned with a range of professional personal computers, believes that such a machine will alter the nature of computing at the upper end of the market as the personal computer has done at the bottom.

The machinery is, however, becoming less important and computer companies are increasingly being asked to deliver total solutions for the office and manufacturing needs of businessmen.

One of the most dramatic areas of growth and competition is to be the automated office.

Pilot schemes are already in operation and many believe that this year significant decisions will be taken by major companies to go ahead with the integrated automated office, to be driven by minicomputer power.

Other areas of growth are expected to be Computer Aided Design, when the West starts to pull out of recession, and computer integrated manufacturing.

The mini companies which will maximise the potential for such growth are likely to be those with the greatest skills in handling distributed data and in achieving the most convenient links between different computers, in either the office or factory.

New pressures on the mainframe sector

CONTINUED FROM PREVIOUS PAGE

loading work from the central processor onto subsidiary processors.

IDC commented earlier in the year: "Univac, Honeywell and CDC will compete with IBM in the high end minis war but Burrough is not yet committed."

In fact, Burroughs is attacking IBM's market but it is looking to supplement and enhance IBM data centres rather than displace IBM machinery.

Sperry Univac is expected to launch a new family of top end machine with greatly enhanced fast storage capabilities within the next two months or so.

But IDC warns: "Lest any need a reminder of IBM's size, consider that at its average 12.4 per cent growth rate, Big Blue (a reference to the colour of IBM's mainframe cabinets) adds nearly the size of a Digital Equipment (the world's leading minicomputer manufacturer) to itself every year."

It goes on: "1981 and 1982 have seen a steady stream of questioning over the BUNCH's future as this group has been slow to move into new, fast-growing markets. Yet the data shows that over the period 1976-1981, the BUNCH have grown faster than IBM.

"This pattern will change as revenues for the BUNCH last year are relatively flat and earnings are generally down, whereas IBM is doing well.

"The next few years should be good ones for IBM. With its continued emphasis on purchase and its desire to pursue any and all markets, IBM is well positioned to ride its 308X (its family of big machines) product cycle for substantial growth, especially since the Reagan administration has lifted the anti-trust monkey off IBM's back."

IBM has, in fact, invested billions of dollars in new manufacturing capacity and techniques which means it can make its hardware at lower cost and reliability than almost any other computer company.

It has placed great faith in a piece of technology it calls the thermal conduction module — basically a metal box cooled with chilled water into which can be packed hundreds of highly integrated silicon chips.

Its reasoning is that it is a simple matter to repair or upgrade a machine simply by uncoupling a single module — which might have the processing power of a mainframe of earlier years — and replacing it with another.

TOP TEN
THE WORLD COMPUTER INDUSTRY

	1981 Revenues	2-year Growth %
1 IBM	$26,111m	14
2 DEC	3,856	31
3 CDC	3,131	19
4 Burroughs	2,934	11.1
5 NCR	2,838	14
6 Sperry Univac	2,718	12
7 HP	1,875	24
8 Fujitsu	1,811	9
9 HIS	1,774	11
10 ICL	1,487	16
Total	$42,285m	15

Source: Hewlett-Packard

What do customers think of it all?

One likened business data processing to a pyramid divided horizontally into three. The top section is computing for strategy—the kind of information and processing needed by top management.

The second section is computing for tactics—essentially the needs of middle managers. The third and broadest section is computing for operations—required to meet the needs of accountants and so on.

The operations section is growing fastest and is chiefly serviced by the personal computer industry—now that IBM, Wang and DEC have made it respectable.

The second section is serviced chiefly by the distributed minicomputer manufacturers while the top section is the preserve of the mainframe.

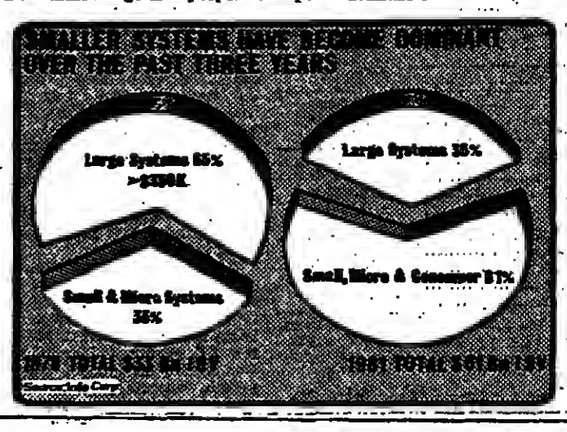
But it all points to the need for mainframe power. To illustrate the computing complexity needed for even simple operations, Dr Louis Robinson, director of university relations for IBM, is fond of pointing out that to inquire of an airline booking system whether a particular seat on an aeroplane from London to Paris is free requires some 250,000 calculations.

Computer systems in the future will require substantial computing power to handle the very sophisticated software now being planned and written to make the job of computing simple for the non-computer specialist.

There are for example, program creation programs like Borrough's Linc and Univac's Mapper. There are Expert Systems which make it possible for the businessman to hold an "intelligent" dialogue with the computer; and there will be editing programs and graphics programs of much greater power than those available today.

The mainframe business is changing shape under these new pressures but the continued need for massive, centralised computing power ensures the dinosaur will survive—and evolve.

Alan Cane



COMPUTERS IN BUSINESS V

Wang, the U.S. computer company which leads the office automation sector aims for $5bn in revenues by 1990

Coming to terms with success

Alan Cane reports from Wang's centre of operations at Lowell, Massachusetts.

WANG, THE U.S.-based computer company, made its name and its fortune in the office. Now, with revenues running at over $1bn a year, it seems to have avoided most of the problems of success endemic in fast-growing companies and is set to make its target of $5bn in revenues before 1990.

Dealing with success has frequently proved as great a challenge for small computer companies as achieving it. Often started by technologists with high engineering skills but little management know-how, many outgrew their financial strength too quickly.

Others lost their way while trying to diversify out of their particular market niche. The temptation, in fact, for these companies to want to appear to be all things to all people seems almost irresistible.

The critical point, many observers believe, is when the company reaches revenues of $1bn. By that criterion, Wang is still on the right track.

Wang's direction for the future lies in the integration of office products into single systems.

It has continued to grow by an average of 56 per cent a year during a recession which has hit other manufacturers badly, yet it is not complacent. Mr John Cunningham, Wang's newly-appointed president, is fond of illustrating what would happen if the company continued to grow at that rate—by 1992, he explains, revenues would be almost $100bn.

"That type of growth is unsustainable. In aiming for revenues of around $5bn by 1990, we are looking at a tenfold growth in 10 years — roughly 20 per cent to 30 per cent growth a year," he argues.

It is a plan that pleases the financial world. Only two years ago industry analysts were worrying about the company's long-term debt — high compared to IBM or Digital Equipment — and poor operating margins — pretax margin in 1982 was only 11.7 per cent IBM sets the standard for the industry at over 20 per cent.

The company set to work to improve margins and now the analysts are happier. Drexel Burnham Lambert, for example, in recommending Wang stock, argues: "We expect margins to improve as operations are consolidated at more efficient rates of growth."

It says: "Wang continued to report exceptional earnings in a weak economic environment. We expect strong growth to continue in 1983 with earnings of $2.30 a share estimated, a gain of 21 per cent over $1.76 a share in 1982."

So Wang seems to be safely through the billion dollar barrier, but that brings its own difficulties. The company is in its 31st year but revenues in 1978 were only $198m; now it employs 19,760 people and Mr Cunningham expects to hire another 4,000 this year.

The recurring theme at Wang's Lowell, Massachusetts, headquarters is the difficulty people there find in coming to terms with the fact that it is now a very big company.

It has meant a considerable change in management style. Wang is the creation of one individual, Dr An Wang, who ran the company single-handed through most of its life. Two years ago the management pyramid began to flatten out as John Cunningham, then executive vice-president, Fred Wang, son of the founder, Harry Chou, treasurer, and John Kropper, senior vice-president in charge of manufacturing, set up an executive management committee.

Now the process has gone one step further. Dr Wang has stepped out of the limelight but remains chairman, Cunningham has become president and Fred Wang has taken charge of research and development.

These changes are more profound than might appear at first sight. From the early days the company's reputation as an innovator has rested on Dr Wang's technological brilliance and his exquisite sensitivity to the marketplace.

He started the company on money made by selling his patents on magnetic core memory (an early form of high-speed computer storage) to IBM. Now Wang sees IBM as its chief competitor.

Dr Wang specialised first in consultancy in memory devices and machine tool numerical control before bringing out the first programmable cassette-based desk top calculator in 1965.

In 1972, the company introduced its 2200 series of small business computers which proved successful (40,000 systems installed). The real turning point, however, was the introduction in 1976 of its first word processing system based on television-like video screens coupled with some of the most powerful word processing software ever written.

The next year, the company moved closer to its origins with the introduction of a very powerful virtual memory computer family, the VS series, which offered mainframe capabilities at minicomputer prices.

More recent products have included the Office Information System range (OIS) dedicated office word processing and information handling systems, the Alliance system which integrates word, data, audio and image processing in a single package, the Professional Computer, Wang's offering in the personal computer marketplace and Wangnet, a communications system for voice, data and image.

So is Wang falling into the trap of offering everything to everybody? "No," says John Cunningham: "If our people invented the best digital toothbrush, we would pat them on the head but tell them 'It's just not our strategy.'"

And Dr Wang says: "We are an office automation company and that is what we will remain. There will be no shift in our direction."

Can the company maintain its innovative flair without Dr Wang exerting his benevolent dictatorship? Fred Wang recalls: "When I was still at school, my father asked me what I thought the most difficult part of the business was.

"He rejected my ideas that it was making a profit or developing new products. It was keeping the people happy, he said. And now I agree with him.

"We believe that our people will figure out best what needs to be done if we can ensure that they are enthusiastic about the time they spend here."

And it is certainly true that there is a dynamism about the massive grey building in Lowell with its floor upon floor of tiny partitioned cubicles, each with its mandatory Wang video terminal, which suggest that the flame is still burning brightly.

What Wang is doing, in fact, is to maintain its market niche —the office—and limiting innovation to that niche.

Its direction for the future lies in the integration of office products into single systems. John Cunningham says: "We have a corporate systems orientation. This is where most office automation companies have failed up to now; they have failed to integrate their products into one system."

But it would also be fair to say that Wang does not have all the answers. Mr Duke Sullivan, who runs the Lowell Advanced System Laboratory—a test bed in headquarters for office systems—agrees that there is no clear view of what the office of the future should look like.

"Perhaps we need a Henry Ford of the office," he says. "I expect there will be multiple solutions. Some people will find it convenient to work at home; others will want to work in small groups, and so on. The technology will allow us to do all this — but only if we allow it. We are not in a technological imperative".

For the future, Wang is working on greatly-improved versions of its text editing software, the facilities which really distinguish between well-constructed word processing equipment and microcomputers with word processing packages lashed on top.

The ergonomic keyboard it introduced with its Professional Computer will soon become standard across the entire product line.

And Mr Cunningham says that the first products for the executive without typing skills or the desire to learn them will be seen soon.

"We have the opportunity to set the standard in office automation for unstructured data devices for people who will never play with keyboards. We will see the first of these within 24 months."

It will all depend on effective software. The problem of software productivity is so acute that Dr Wang established the Wang Institute of Graduate Studies in 1979 to create a centre of excellence for software engineering—the development of better ways of creating good software. Now there are 35 students using a galaxy of equipment provided free by Wang, DEC, Prime and Apollo.

The shape of the office of the future may be uncertain but it looks a good bet that equipment labelled "Wang" will be part of it.

Dr An Wang, left, chairman of the board. He received his university education in Shanghai, China and moved to the U.S. in 1945. He began his computer manufacturing company in Boston. Mr John Cunningham, right, is the newly-appointed president of Wang Laboratories, of Lowell, Massachusetts, and is responsible for 18,000 Wang employees around the world

Many small businessmen are frustrated in their selection of the right hardware and software, as David Churchill reports.

Key questions for purchasers

BUSINESSMEN wanting to buy a small computer will find that the retail market for micros is still in some confusion with no clear-cut retail patterns firmly established. This is perhaps not surprising given the dramatic increase in both the supply and demand of the small computer market.

There remain, however, two key problems for the business user of micros (as distinct from the hobbyist user). First, the businessman needs to know *what* to buy that is best for his purposes, and second, he needs to know *where* to buy both the hardware and software.

A recent survey of some 1,200 businessmen, carried out by the Romec consultancy, observed that "businessmen, as distinct from home hobbyists, educationists and the like, must concentrate on running a successful operation; relatively few wish to risk the serious consequences of pouring hours down the bottomless black hole of do-it-yourself computing."

Finding out what is the best type of hardware and software for their particular purposes can be a fraughtful experience for many small businessmen with no experience of data processing. The Consumers' Association, for example, found that anyone buying a small computer could find the experience "very frustrating."

One problem the Association identified was that some of the staff in the specialist computer shops which have mushroomed over the past couple of years were "not as knowledgeable as might be expected."

This is a problem faced by many businessmen who are bewildered by the array of options open to them. The first practical step is to peruse the many small computer magazines now on the market to gain some idea of the jargon and so on (so that you do not appear too "green" when in the shop) and then to have some clear idea of what you want the data-processing capability for.

Reputable retail outlets *will* be able to offer advice on the best system for your purposes, although there is always a danger that there may be attempts to palm off slow-moving stock on the unsuspecting business customer.

The right equipment

Where the business user should buy from is equally a problem, since shops of all types now seem to have a foothold in the micro-computer market. Boots, W. H. Smith, Dixons and Rumbelows all retail small computers, for example. It may be that the businessman who knows exactly what he wants may be able to find the right equipment in these shops at lower prices.

The main specialist retail outlets that have emerged so far include the Tandy operation. Tandy is the largest retailer of home computers in the UK, with some 23 shops in this country as well as a further 94 dealerships.

The Currys electrical goods chain has also set up a chain of small specialist shops selling small computers, and is reported to be doing very well. Total sales of specialist computer shops were estimated at some £75m last year and are expected to top £100m this year.

This target will be helped by the planned expansion of the California-based Computerland operation in Britain. Computerland has avoided the UK until recently because another company had the same name. However, there are two Computerland stores now open in Southampton and London.

Computerland plans to open up some 40 outlets in Europe this year, of which at least 10 are expected to be in the UK. Mr William Millard, the company's chairman, says that "I expect the market for personal computers in Europe to explode."

Computerland's expansion will be franchising. For a fee of around 5 per cent of the annual turnover of the store, the franchisee gets advice, training, the economies of scale involved in buying some 3,000 products centrally from over 150 manufacturers.

"Another major area of retail distribution is mail order, although there has been problems with some of these distributors over delays.

"Members buying by mail order were often involved in a long wait for delivery," the Consumers Association points out.

In such a rapidly developing market, however, distribution patterns are certain to change significantly in the coming months. Such change is likely to see more chains become well-established and, hopefully, offer a better service for the business customer.

A computer eases life for one newsagent

How good news came to Martin's

THE THUD of a newspaper as it falls through the letterbox is an early morning sound as pleasant to most people as the first taste of coffee—regardless of whether it heralds the arrival of the Sun's Page Three or the Share Information Service of the Financial Times.

The job of the newsagent who gets it there, on the other hand, is far from enjoyable unless he likes getting up in the dark, laboriously checking stock against expected wholesale deliveries, logging sales ledgers, adding up accounts by hand and dealing with disgruntled customers whose monthly bill includes the price of a Beano never received.

Happily for Bob Tuttle, manager of the Stevenage branch of Martin the Newsagent, life has been a lot easier than that since December thanks to GoodNews, a small computing system which has both speeded the distribution process and improved the efficiency of his news stock control and internal accounting procedures.

Martin's have 510 branches up and down the country and following the successful Stevenage pilot project over the last few months, the plan is to instal the GoodNews system in about 200 branches.

And through Martin Halo, a joint company set up with the Oldham-based manufacturers Halo, the idea is to capitalise on the expensive software development of the past couple of years and market the system to the nation's army of independent newsagents.

In Bob Tuttle, meanwhile, Martin's seems to have chosen the ideal "guinea pig" to test the new machine, a 64K micro powered by Sony disc drives, featuring a 5-in VDU, and incorporated into a box little bigger than a normal cash register.

A newsagent for many years, Tuttle was on his own admission sceptical at first about the new technology but now wonders how in the past he could have managed without it.

‘ Initially I didn't believe it could do everything that was claimed ’

"I admit that initially I didn't believe it could do everything that was claimed. But the effect on my working day and on my staff has been tremendous. Our old methods were time consuming, the work was mundane and partly as a result of this we tended to make mistakes.

"We get into the shop at around 5 am to await delivery of the morning's stock of dailies, weeklies, monthlies and partworks. Each item has to be checked but whereas previously this involved four separate logging processes, the computer now automatically checks all the information, prints out lists for the newsboys and girls, and thereafter does a lot of other processing, including preparing statements and invoices."

Tuttle's old manual stock control and book-keeping systems—which he retains in the back of the shop, presumably for the benefit of future historians—had to cope with the orders of some 1,500 customers and about 4,500 different daily combinations of customer and publication. In all, he handles some 600-700 titles.

Among the daily chores were keeping track of which publications had arrived from the wholesaler; which customers did and did not take alternative newspapers in the event of short supplies; remembering to stop newspapers during holidays and in some cases keeping periodicals until customers returned; taking note of price rises and adjusting each individual account; and stopping delivery when accounts remained unpaid at the end of a five-week period.

Says Mr Jeff Hodgson-Jones, a director of Halo: "The problem was that there were effectively two separate manual systems—one for checking the deliveries in and one for doing the accounts. There was nothing that automatically transferred information from one to the other, with the result that it all had to be done by hand.

"This is what we have overcome with GoodNews, which was designed very much with the newsagent's routine and organisation in mind."

Bob Tuttle adds: "With the old system we tended to keep a lot in our heads and write it down later. One of the biggest drudgeries was bringing the balances forward each week and going through every customer when a price went up. Whenever I put someone new on the job it was fine for three months but after that they usually got fed up and started making mistakes."

The GoodNews system starts work with Tuttle when deliveries arrive from the wholesaler. He still has to be at the shop at 5 am, but now he simply keys in the number of newspapers and periodicals as they come in and leaves the machine automatically to print out details for the newsboys and girls.

This, of course, is likely to vary from day to day, so the programme not only takes into account customers' orders but unusual "flags" such as holidays or unpaid bills.

"The rounds lists can be printed in a variety of sequences," says Tuttle, "either pre-set or interrupted, according to convenience—alphabetically, geographically or by newsboy number. The system only itemises goods in and customer deliveries for that day, automatically charging them at the same time, so customers cannot be billed for goods not delivered or receive their newspapers when they are away."

The system sits on the counter and acts as a point-of-sale facility

The GoodNews system—it sits on the counter and also acts as a point-of-sale facility for other goods—can update customers' accounts, print statements, invoices and reminders, bring forward weekly balances, log price changes and amend daily sale or return orders to wholesalers.

"It now takes less than half-a-minute to key in a price change and GoodNews does the rest," Bob Tuttle says. The point-of-sale facility, however, remains available throughout and comes into its own particularly when customers are paying their accounts.

Each one has his or her own account number which is keyed into the computer; an itemised statement appears on the VDU and when the money is paid over customers get a receipt showing exactly what they have paid for.

The system can print reports on products, suppliers and customers so that among other things the newsagent can check invoices against deliveries, products by type and frequency and account restarts. Enhancements planned for later this year will allow the newsagent to break down non-newspaper sales into a number of broad categories and a facility to help with VAT accounting.

Bob Tuttle says that learning to use the system was fairly straightforward — initial training was provided and manuals supplied. "The machine has saved a lot of error, aggravation and fatigue," he says.

"Quite apart from the fact that one compact system replaces all the old ledgers and the cash register — which is important when working in a limited space — it saves time and helps me do my job better. Inevitably, customers benefit by getting a more efficient service while the staff spend more time in the shop."

Martin's managing director Peter Martin says the company looked at a number of existing systems when it first hatched plans to computerise news administration 18 months ago. The idea of marketing GoodNews to independents in the trade only crystallised once the pilot project had been declared a success. "We think the stock control, VAT and bookkeeping programmes will be of most interest to the independent trade."

GoodNews at the moment is a "stand alone" system. In the long term, however, Martin's intend to computerise their stock control, a task which could well be achieved by linking the new micro to the company's mainframe computer.

Tim Dickson

Mr Bob Tuttle (left), manager of the Stevenage branch of Martin's, with Mr Alan Campbell and Mr Jeff Hodgson-Jones, directors of Halo, manufacturers of the GoodNews system, seen here.

OFFICE AUTOMATION EQUIPMENT REVENUES—1981-87
(values in $m)

	1981	Average annual growth %	1987
Copiers	2,367.0	3.2	2,864.0
Facsimile	67.1	32.2	358.4
PABX's	1,260.0	3.3	1,527.0
Electronic typewriters	659.4	25.5	2,575.5
Stand-alone word processors	505.4	8.9	843.9
Dedicated clustered word processors	61.8	6.4	89.7
Desktop computers (business/professional sector)	739.0	27.2	3,126.0
Total	5,659.7	12.3	11,384.5

Source: IDC Europe.

Case history: Glaxo Pharmaceuticals

A system that links together 14 sites

AS FAR AS any of the 750 users of computer terminals in Glaxo Pharmaceuticals is concerned, the company might as well be operating on a single site. The users range from the storeman checking stock availability to a director examining an analysis of the previous day's sales. In practice they may be on any one of 14 sites throughout the UK from Montrose in Scotland to Greenford in Middlesex.

Most of the key information within Glaxo Pharmaceuticals is now available in seconds from more than 500 terminals up and down the country. Until a few years ago it could have taken days or even weeks to extract and collate much of the information managers now take for granted. The system caters for a host of needs from basic financial information, stock and production levels, to word processing, electronic mailbox and even a daily news summary.

Glaxo Pharmaceuticals, a large British subsidiary of the UK-based Glaxo Group, embarked on a major change in its computer systems in 1978. The reason for the change was reorganisation of the company.

Glaxo Operations UK was established from three subsidiary companies manufacturing and marketing pharmaceuticals in the UK and exporting to other Glaxo subsidiaries and third parties. The three companies, each operating in different sectors of the market, were Evans Medical, Glaxo Laboratories and Allen and Hanburys.

Glaxo points out that all three companies used the same basic skills and techniques in manufacturing, marketing and administration so there were opportunities to improve productivity and efficiency by combining their activities under one management.

The main benefit expected of the rationalisation was to reduce administration and overhead costs through an advanced computer-based information system. Up to that point the three subsidiaries had been responsible for their own planning and control systems. Each had its own data processing, mainly based on ICL mainframe computers but also using equipment variously from IBM, DEC and Redifon.

Mr Iain Lee, director of management services at Glaxo Pharmaceuticals, explains: "We had to produce a computer system to meet the new organisation and requirements. The existing systems did not have the features or the communications facilities which we needed.

"We felt we wanted to put the processing power where it was needed, where as it had previously been centralised at the mainframe. As we wanted something which was on-line and easily available on all sites, we concluded we needed a network of minicomputers."

‘ The full benefits of such a system are not easy to measure ’

The company also took the opportunity of the reorganisation to build a framework for progressive office automation rather than just changing its data processing. Glaxo's search for the right products and systems was wide-ranging but the number of companies which could provide a solution to its problems at the time were few.

It began by approaching its main computer supplier, ICL, which at the time did not have the suitable hardware or software for Glaxo's needs. The company also talked to IBM, Honeywell, Hewlett-Packard, Digital Equipment (DEC), Data General, Prime and Univac.

Glaxo finally opted for Hewlett-Packard on the grounds that it could demonstrate the two most crucial aspects of the system. These were the database management system and the network communications software. "Hewlett-Packard was the only company at the time which could give us a working demonstration rather than offer promises," says Mr Lee.

The first system was installed in Greenford at the end of 1978. Now Glaxo has 16 of Hewlett-Packard's HP 3000 minicomputers in six locations serving 14 different sites in the UK including Speke in Merseyside, Barnard Castle in County Durham, Ulverston in Cumbria and Ware in Hertfordshire. The computers are connected by 24 high-speed data links provided by British Telecom.

The new system meant that the company could organise and plan its activities as if it was operating on one site instead of 14. It also meant that when the company reorganised again in 1981 creating three independent companies, the system was flexible enough to cope with the change.

The system is currently being used for 90 per cent of Glaxo Pharmaceuticals' data processing needs. Only one ICL mainframe remains in the company and is used for functions where there is no need for "on-line" services.

Application of the system now includes: management accounting, production costing, debtors analysis, forward requirements, order processing, production planning, invoicing, sales forecasting and budgeting and financial modelling.

Glaxo points out that it is not an easy task to introduce a complex system to all levels of staff and it has involved considerable training. "Radical new concepts cannot be assimilated quickly by a large group of staff and the training requirements tend to be underestimated," Mr Lee says.

The full benefits of such a system are not easy to measure because many are intangible—such as the advantages of giving managers more information more quickly. Installation has coincided with a substantial growth in Glaxo's business and Iain Lee speculates: "Could we have sustained this rate of growth without such a system?"

There are a number of plans to extend it still further. The number of terminals is expected to grow until eventually they may be as commonplace as telephones. Mr Lee also wants to integrate the private speech telephone network which links the 14 sites with the data network with common switching.

Glaxo is also looking at introducing a fibre optic switching loop to link some of the terminals and computers which would offer greater efficiencies and flexibility. And microcomputers which are increasingly being used within Glaxo factories are also to be linked together and then connected to the main network thus establishing several layers of computer network.

Jason Crisp

COMPUTERS IN BUSINESS VII

Case study: The Trustee Savings Bank

Why TSB went outside

ONE DAY a Trustee Savings Bank manager might ask Peter Stone for a run-down of the operational costs of one of the banking group's computers over the past three years.

The following day the same manager might ask him for a projection of computer costs for the next three years. A third request might be for an assessment of the trade-off between using mere mortals and investing in more automated facilities.

For Stone, who is finance manager of TSB Group's Computer Services, these would be routine enquiries which are the stuff that modern-day sophisticated "number crunchers" are made of.

The TSB, which is the fifth largest banking group in the UK, with 11.5m customer accounts, assets of more than £6.5bn and 24,000 employees, has no shortage of sophisticated equipment; it runs Burroughs and Univac mainframe computers for customer accounts, an IBM system for central cheque clearing and Digital Equipment Corp machines for certain in-house time-sharing systems.

In fact, it was the first large-scale-branch bank enterprise in the UK to use on-line real time systems with counter terminals some 10 years ago, a facility which can provide most of its 6m customers with an immediate update of account balances on demand.

The TSB, which has been a substantial user of computers since the 1960s, has an internal financial accounting facility—common to most banks—but which has been extended to supply management information relevant to both financial and manpower planning on an in-house time-sharing basis.

It also does research and development into any software and hardware that the group might want to use and runs a separate unit, which Stone is in charge of, providing the financial information necessary for determining policy towards computer facilities.

Yet, in spite of all this sophistication, when Stone wants to come up with what is essentially routine, albeit complex, management information, he chooses to use the facilities of an outside computer bureau—two in fact.

He uses the London Business School's computer for what he describes as a "mathematical statistics package" for business forecasting and Comshare, one of the UK's 10 largest time-share computer services companies, for management information purposes.

Stone explains: "When you're dealing with a large-scale job on the computer—tens of millions of transactions and processing a payroll of many thousands of employees—the work is more or less a production line function.

"When it comes to producing information for management purposes, it becomes apparent that you have to use data that is convenient for the people using it."

Stone says the information readily available through existing programmes is "not in a suitable form for management purposes."

> ‘If we don't give satisfaction our clients can pull the plug very easily.’

One of the main problems with mainframes, he says, is that they are remote from management.

Stone says that to go outside to a time-sharing facility it is essential to have access to three main resources—efficient software, machine reliability and good support for writing complicated programmes.

"If you can get these three things, one ought not to run into major problems in creating a good management information system."

For Comshare, the TSB is one of the largest of its 1,600 customers; at any one time it has between 10 and 14 people working part-time on the account.

At present it works for the TSB in four main areas. It runs:

- A manpower planning system for the group, using models drawn up by the Institute of Manpower Studies in Brighton.
- A small model concerning staff retirement benefits.
- Statistical analysis of cheque transactions and deposits.
- Business development forecasting, in areas such as mortgages and loans.

Richard Fox, an account executive of Comshare's banking group, says these applications are typical of the types of systems which are more economical to run outside a company's data processing centre.

"We can provide ad hoc systems very quickly and economically. There are applications of certain types of systems which just wouldn't be viable—financially or time-wise—to put in-house.

He says there are very few major problems in dealing with a client such as the TSB. "I suppose that as far as we're concerned, our main problem is ensuring that the client is continually satisfied—if we don't give satisfaction they can pull the plug very easily."

Arnold Kransdorff

Mr Meyer Sopher, founder and managing director of the British Distribution Company—heavily committed to on-line computing.

How BDC refined its tuning

THE BRAND NEW minicomputer arrived at the premises of of the British Distribution Company, a north London electrical wholesaler. in February 1978 when the annual turnover of the company was £8.5m. Now five years later, despite the recession, BDC is this year expecting a turnover of between £26 to £28m and is planning further expansion.

The extensive use of interactive on-line computing on 60 terminals linking BDC's three sites has not single-handedly created such growth. The company aggressively pushes brand leaders, and goes in for unit pricing with special discounts for only the largest key accounts.

The marketing effort is underlined by a monthly magazine for all customers giving details of the latest prices, which products are about to be heavily advertised, and which are selling fastest.

Mr Meyer Sopher, founder and managing director of BDC, who has built it up from a company with a turnover of £30,000 a year, 20 years ago, is convinced however that he could not have coped with the present rate of growth without a heavy commitment to on-line computing.

Mr Sopher has spent £110,000 on his computer system. It is based on a Computer Technology Ltd (CTL) 8046 mini plus a backup to avoid the danger of any down-time.

"Without the computer system we would have needed at least 200-250 extra people costing £250,000 a year," says Mr Sophal who employs 190. Even if the right people could have been found and trained quickly enough BDC would have been a much less efficient company, he believes, for virtually every aspect of the business is run on the computer.

It holds and continuously monitors details of every item in the company warehouses. More than 8,000 product lines from more than 300 suppliers are held, covering everything from lighting to domestic appliances and electrical equipment for contractors.

Each trade counter has a terminal on the desk giving instant details on availability and price.

When an account customer phones an order his credit rating and the history of the account can be checked at once on the screen.

When an invoice has been issued at any trade counter the information is instantly available on the screen of 25-year-old Mr Joseph Sopher, the director in charge of both sales and purchasing.

Mr Joseph Sopher can watch on his desk the changing fortunes of the company minute-by-minute and see which lines are selling particularly fast together with the profit margin involved.

"It's very exciting during the Christmas period. You can watch the sales totals mount second by second," he said.

Accurate knowledge of what is selling and what isn't means that BDC can fine tune their marketing almost on a daily basis and offer special discounts and promotion campaigns.

The on-line computer power means that bad debt is also a minor problem at BDC. Staff are warned immediately when a customer's credit limit has been reached. Even if purchases were made simultaneously at different BDC warehouses.

On a turnover of £15m bad debt totalled £3,000 and although as the company expanded Mr Sopher relaxed his vigilance a little—it was £30,000 when turnover reached £20m—he hopes to get the figure down to £15,000 this year.

Most of all the computer system allows BDC to combine a large stock with fast service and delivery. The distributed computing power will also allow the company to expand to other parts of the country by setting up local trade counters while still operating from their large central warehouse in London.

BDC will probably move over to the new CTL non-stop computer, designed to take on Tandem of the U.S., and put more effort into automating its warehouses.

But one thing is unlikely to change, according to Mr Rysiek Tomczek, marketing manager, the company's devotion to print. The printed monthly magazine gives the "longevity" of message the company needs.

The layout of the BDC Times, and mid-monthly supplements, however is of course designed on a computer graphics machine.

Raymond Snoddy

ICL's Perq scientific computer (left) installed in an engineering drawing office. The computer has 1 Mbyte of store, a high quality bit-mapped graphical display, a 24 Mbytes Winchester fixed disc and a 1 Mbyte floppy disc. Right: The computer-aided engineering facility of Marconi Avionics at Rochester, heavily engaged in creating a range of standard central air data computers for the U.S. Air Force and U.S. Navy, under a $5m development contract won by the company

The impact of the computer has revolutionised design and manufacture

Keyboard magic in car industry

IN THE auto industry, computers have fast been taking over virtually every aspect of the car, and to a lesser extent commercial vehicles: This ranges from design to—albeit still in the future—the customer's purchase without leaving his arm chair.

The forerunner of this last aspect is about to be demonstrated to 2,500 Prestel users in the Birmingham area, who are to be linked, on a trial basis, directly with Talbot UK's own dealer network's computer system. At a touch of the keyboard they will be able to find out about any new or used car, of any make, in stock at the 100 or so of Talbot's 600-strong network currently linked with the system.

BL Technology, the state-owned car group's research and development arm, says that when such systems are extended to embrace the finance houses and banking systems, the buyer will be able to decide his purchase and pay for it without even visiting a showroom.

It is in terms of design and manufacture of the car that the impact of the computer has been greatest to such an extent that it has drastically changed the picture of the world motor industry even compared with just three years ago.

Then, it was thought that the 1990s would see just a few major international manufacturers, each producing at least 2m cars a year to achieve the economies of scale needed to remain competitive.

Some of those economy of scale arguments still apply: components such as engines and gearboxes need to be produced in quantities of 500,000 a year at least to be really cost-effective.

There is no reason why manufacturers should not share them — they are increasingly doing so.

Components sharing, when added to the computer-controlled, flexible manufacturing facilities which have spread in the past couple of years from Japan to Europe and the U.S. means the prospects for the more vulnerable car makers producing 500,000 cars a year or less, such as BL, are being transformed.

The advent of flexible systems is bringing about the demise of the old, and expensive, processes of laying down new assembly lines for the introduction of individual new models.

The smaller manufacturer can adjust almost instantly to changes in market demand.

To illustrate: the Austin Rover lines at Cowley where the Maestro models are being built can handle up to five differing cars simultaneously; and they will need to do so as different variants of the LC 10 range—on which BL's future depends—are introduced over the next three years. Similar abilities are contained within Ford's new assembly facilities at Dagenham where the Sierra is being produced.

At Cowley, when the facilities are being fully utilised, computers will shift widely varying batches of components for different models around the plant, ensuring that precisely the right components arrive at the right assembly stage at the right time; computer-controlled multi-welders and other robots will "recognise" the particular model of car to be built next, and automatically reprogramme themselves to handle the constituent panels and weld them in the right places.

To draw on an example which has been functioning for several years, Toyo Kogyo's plant at Hiroshima happily builds front-engined, rear-drive sports cars, large saloons, small front-wheel drive hatchbacks and estate cars in quick succession on the same line and rarely, if ever, tries to stick a large saloon's engine in the sports car's boot.

So, with the same total capacity, the smaller manufacturer can ring wide changes on models and adjust almost instantly to changes in market demand—and his traditional cost disadvantages vis-a-vis the General Motors and Fords are cut by a large margin.

That is the fundamental reason why the consensus is growing that the industry of the 1990s will consist of not just the industry giants, but most of the existing companies linked by a spider's web of collaborative agreements on components, while still retaining extensive individual model ranges.

The computer's uses extend well beyond this.

Using the Maestro example again: Austin Rover claims that the car was the subject of the most extensive implementation of computer-aided design and manufacturing techniques (CADCAM) yet seen in the UK motor industry and on a scale to match Europe's industry leaders.

The process began with numerical master geometry techniques to delineate the body surfaces according to the design team's outline ideas.

This mathematical definition was then stored in Austin Rover's IBM mainframe computers as a master database for

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COMPUTERS IN BUSINESS IX

How the chemical industry uses computing power. Report by **William Dawkins**

Development in three phases

AT A time when Britian's depressed chemicals industry is struggling in the face of weak prices and declining demand to rid itself of overcapacity, chemical companies' ability to use computing power to increase efficiency and cut costs is clearly crucial.

However, computers' traditional function of saving time and manpower has changed radically to a more qualitative role. Few managers are able to put a figure to the contributions their computer systems are making because those contributions do not replace human effort—instead they do jobs which people never had the capacity to attempt.

As one computer manager put it: "We have passed the stage when computers merely helped to cut costs. The benefits now are intangible. We are talking about information and the value of information rather than savings on clerks."

The vision of a centrally controlled plant with raw materials being fed in at one end and leaving the other without human intervention is still far off, although the chemicals industry has perhaps got nearer to it than most.

Computer applications in the industry have developed in three distinct phases, the main thrust of which is an increasing decentralisation of computing power to both the production and top management levels.

● Batch processing by mainframe computers emerged in the mid 1960s mainly as a way to analyse costs and plan production. Under this system, information had to be physically taken to a single central computer and processed in lots before being returned—a time consuming and inflexible process.

● A decade later, the falling costs of computing encouraged the arrival of distributed data processing, which removed the restriction of being tied to a single central machine. This opened a whole new range of possibilities, including easier use of computers for process control and monitoring, product planning and design from remote terminals.

● The most recent stage involves the development of computer network systems so that any workstation on the network like the Apple II on the desk of the chairman of BP Chemicals, in itself as powerful as an IBM mainframe 20 years ago—can gain access to information ranging from company accounts to the performance of a plant hundreds of miles away.

Norsk Hydro Fertiliser is an example of a company keenly aware of the advantages of computer decentralisation. In the past 18 months, the company has switched from dependence on a single ICL 1902T to an IBM 431/K02, linked to three Hewlett Packard 3000 processors, with five terminals spread at plants from Leif to Ipswich.

"The deliberate move from on central machine enabled us to put computer power where the action is," says Mr Peter Skinner, the company'a computer manager. "We actually had people over 60 years old finding themselves using terminals and able to do it."

Norsk Hydro Fertiliser: 'computing power where the action is.'

The greatest penetration has been at an operational level, mainly in accounts and ordering although decentralisation has made the process of linear programming more flexible.

This is a comparatively well-established technique, used on the old mainframe, by which a number of production options, such as site, distribution costs and the constituents of a chemical product, can be expressed mathematically on a computer, which will juggle the variables until it comes up with the best solution.

The next step, says Mr Skinner, is to introduce greater direct direct management participation in the system. The demand for this is strong. "There has been a change from the 1970s when I was very much in a selling situation to one where my main concern is how quickly I can get the service running."

BP Chemicals, which invests £5m a year on computers, is already well advanced in its drive to bring computers to managers' desks. All seven of its directors and 120 of its executives use desk-top machines. Mr Chris Steward, head of management services, encouraged this trend when he set up a microcomputer support group 18 months ago, which made it clear that the machines were avilable to all, along with maintenance and training.

At an operational level, BP Chemicals' computer applications fall into the following main areas, in line with the rest of the industry:

● Process modelling, in which a programme, usually run on a microcomputer like an Apple or a Rair, will create a representation of n chemical reaction, giving valuable clues as to how costs can be saved. The microcomputers used here do essentially the same task as BP Chemicals' mainframe performed 20 years ago, only at n tenth of the cost and more flexibly.

● Production planning — by using linear programmes similar to those employed by Norsk Hydro, this application simply helps to determine the best use of resources in chemical production.

● Maintenance—here "closed loop" programmes are used to double-check the performance of instruments on site and predict breakdowns within an accuracy of one in 10,000. The company has also devised a more complex programme, known as Epac, which can check and predict the maintenance needs of a whole plant. This allows repairs to be made as and when needed, in contrast to the former practice of dismantling and checking a complete factory every year er so to check where repairs are needed by eye. Steward. "It allows us to run rather than costs," says Mr Steward. "It allows use to run predictive rather than preventative maintenance."

In general, BP Chemicals' production oriented computers are performing the same functions as they were 10 years ago, only far more efficiently. The next advance at the production level, says Mr Steward, must be in the equipment the computers help to control.

In this respect, computer aided design, such as that used by ICI, Britain's largest chemical group, has a key role to play. The arrival of three-dimensional graphic design systems, such as that made by Prime computers, has given ICI's engineers the potential to design all the steelwork involved in building a chemical plant in a fraction of the time it takes to do the same work on paper.

The company is working on a prototype programme, known as Isosteel, the scope of which is indicated by the fact that it contains 100,000 lines of instruction, compared with the 300 to 1,000 lines in an average microcomputer programme.

"The point about engineering computing is that most engineers think in drawing," says Mr Derek Crooke, manager of ICI's designs systems group, in explaining the impact of graphical systems. Isosteel has had less complex forerunners in ICI, used to design heat exchangers and chemical vessels.

BP Chemicals: seven directors and 120 executives use desk top machines.

Shell Chemicals has introduced process control and monitoring to 12 of its 19 production complexes and is now investing progressively in plant informations systems. The company has invested £2.7m in computer hardware over the past four years and the UK group as a whole has seen its professional computer staff grow from about 100 to more than 1,000 over the past decade.

The principal thrust of Shell Chemicals' computer development strategy is to provide on-line access to continuously updated information on stocks, orders, customers and products.

The system used for this, called Logistics, has been under development since 1977 and will be in full use this year. The software—usually the most expensive part of any computer system—took 70-man years, representing a cost of about £1.5m to write. Mr Satish Arora, manager of information and computing services, says: "The objective is to improve efficiency of operations and ultimately provide a better service to customers."

Before Logistics was developed, Shell Chemical's management was dependent on comparatively inflexible batch processing. With the installation of two IBM 43-41s, the company aims to have 200 terminals installed countrywide by the middle of this year. Already, says Mr Arora, the savings from Logistics have been "immeasurable."

A smaller company, Adrox of Bourne End, Buckinghamshire, a subsidiary of Brent Chemicals, provides an example of a less usual application of computers, which unites electronics with chemicals to provide an automated package.

The company supplies e fluorescent penetrant used to identify faults in turbine blades. Traditionally, the penetrant is sprayed on to the blade and wiped off before the surface is examined under ultra violet light. Human inspectors have to spot the fluorescence left behind in any cracks.

But Ardrox is developing a microcomputer programme which automates the process with the help of a robot. In its completed form, it should do the job twice as fast as humans and unlike humans it will of course never get tired or miss a potentially expensive fault in a £600 turbine blade. The machine includes an automated laser scanner, which is tuned to response to fluorescence using software controlled by a Z-80 microprocessor.

The equipment will cost up to £160,000 and is undergoing trials with Rolls Royce and Arco-Lyoming of the U.S. Rolls has already offered Ardrox a contract to make a similar machine to spot faults in turbine discs.

"We try to take the total systems approach," says Mr Gordon Stewart, Ardrox's deputy engineering director. "We like to say to customers we can supply the chemistry to do it, but we can also supply the equipment."

Car industry magic

CONTINUED FROM PREVIOUS PAGE

the complete body design. Further computer models assessed the strength and safety of the overall design, and the functioning of its main components.

The finite element analysis techniques used in the later stages are well established—Austin Rover has been using them since 1971—but, says Austin Rover, the Maestro was the first model to be manufactured exactly to the definition of the master database in all respects.

All the above means that another traditional, and expensive, process is disappearing—the building of a long succession of test prototypes. The same master database was used in the design and manufacture of press tools and jigs for many of the car's 300 body panels.

Some 1,000 press tools were needed altogether, and many of them were evolved by tool designers based at 20 terminal linked inter-actively with the mainframe IBM computers, using light pens to build up the tools' design from master database material.

Increasingly, this type of computer deployment is not only cutting costs but new model lead times. It is also allowing changes to be made to evolving models much more speedily and cheaply.

It can be expected, moreover, that the flexibility provided by the computer will come into play even more as the industry moves in the late 1980s towards another revolutionary phase — the manufacture of cars not with pressed sheet metal bodies but using skeleton aluminium frames clad with plastic panels.

The advent of this type of car in volume production is expected to give manufacturers much more flexibility yet; not only to update models much more frequently than currently but to allow a large number of variants to be made easily and cheaply, as the expensive tooling for sheet metal work will not be required. In those circumstances the computer's role will be even more vital both in the design process and in the expected greater complexity of materials handling.

Toyota of Japan has announced an electronic modulated suspension system.

The computer is also fast taking over the car itself. The introduction of voice computers on Renault's new 11 model and the Maestro is just perhaps the rather gimmicky tip of the iceberg.

Motor industry technologists regard as just a few years away the achievement of a vehicle in which the driver's controls consist basically of a steering wheel and blank TV screen. The only information shown on the screen would be that immediately needed—speed, for example—or that summoned up by the driver (voice) request, or the flashing of emergency signals (accompanied by voice warning).

Ergonomically, and in every other way, such systems would allow the driver to move his vehicle from A to B in the most efficient way. But the manufacturers might have some psychological hurdles to overcome in trying to woo drivers away from the penchant of many for "Starship Enterprise" type dashboards exemplified by the current BMW 735i.

But out of the driver's sight, the computer is already well on the way to controlling the car's working systems. Computer-controlled engine management systems are well established; anti-skid braking systems, with each wheel prevented from locking by microcomputers—allowing a driver to "panic" brake and steer at the same time—have started their progression down from the luxury car sector.

In the past month Toyota of Japan has announced an electronic modulated suspension system. It uses a microcomputer to adjust the damping forces of the shock absorbers at each wheel. So not only can the driver select hard er soft ride, depending whether he is driving fast and needs good handling or whether he is cruising along poor roads; the system also increases the damping resistance on one side automatically during cornering, thus greatly reducing body roll. It also automatically steps the front of the car dipping or the back squatting on hard braking or acceleration.

It is also probably no more than three to four years from now that the gearbox—automatic or manual—will start te become e thing of the past; replaced by computer-controlled constantly variable transmissions.

In other fields computerised Viewdata systems are emerging to challenge other motor industry traditions. The monthly publication Glass's Guide, regarded as the motor trade's "Bible" on trading prices now has a rival in Visi Valuear launched at the start of this year by Viewdata Recall Systems and Data Recall.

It provides stock market type daily listings of used car prices achieved all over the country. To it is being added a host of other systems; financing packages, vehicle transport information and others yet to come. Its managing director, former Talbot executive Mr Mike Otty, points out that his main difficulty is in identifying all the system's possibilities rather than whether it has limitations.

Greater emphasis on integrated systems

New manufacturing applications

THE LONGEST established use of computers in the manufacturing environment is in production control in which customer order input, materials/component purchasing, stock control, shop order release, bill of materials and similar functions can be speeded up and generally made more efficient.

Nowadays these areas are the subject of a good deal of integration using a common database — an electronic collection of continuously updated facts to which all the participants have immediate access.

A typical example is IBM's Communications Oriented Production and Information Control System (COPICS), which the company describes as "one set of books organised as a company database." The people responsible for recognising and recording events use keyboard/screen terminals to enter their data instead of pen and paper.

The information is then readily accessible to other users, who look at only the latest version of any particular fact.

Chemical manufacturer Diversey uses an IBM 4331 computer with COPICS and has achieved improved stock control, a tracking system for raw materials and finished goods, and better methods of forecasting.

R. A. Lister, which makes about one diesel engine a minute and grapples with 40,000 part numbers, also uses COPICS on an IBM 4341. An important outcome has been shorter lead times, positioning the company more favourably in a highly competitive market.

A similar system from NCR called Interactive Manufacturing Control System (IMCS), was recently the subject of a £180,000 order by Bonar Long, the Dundee manufacturer of electricity grid system transformers. Using display terminals linked to an NCR I-9040 computer, purchasing, sales and production control staff will have instant access to stock and production information. A similar NCR system called Mission is going into Martonair, the West London pneumatics company.

Earlier this year, Burroughs revealed the first installation of its TMS system, which it claims "embraces all the elements of financial and production control on a single database." It is installed at the Tynemouth plant of Stewart-Warner, the U.S.-based pneumatic tool and pump manufacturer.

Running on a Burroughs B-1900 machine, TMS saved the company £500,000 in the first year of operation — at a time when the recession, particularly in the building and civil engineering industry, had reduced output to a fraction of available capacity.

Burrough's new 'Total Manufacturing System' claims to embrace all the elements of financial and production control on a single database.

It was interesting that John Holmes, Stewart-Warner's manufacturing director, steered clear of attempting to revive the entire plant with any of the latest elixirs such as robotics and flexible manufacturing systems (FMS).

The company was much more concerned with keeping the existing machine tools fully occupied by ensuring that information flowed as smoothly and as quickly as possible.

Most of the larger computer companies and some of the smaller ones offer systems of this kind, with various degrees of integration. ICL, for example, has an on-line real time system called OMAC 29 that runs on the 2900 and ME29 machines.

Typical users are Albright & Wilson and Bostik, but there are 200 OMAC 29 systems in use world wide. ICL also has 500 installations in smaller companies of a system called SAFES 25. It has also made a speciality of data collection terminals (the 9600 series) of which nearly 3,000 have now been shipped. The company claims some 8 per cent of the Western European market for such terminals.

While these basic, financially oriented computer applications have been emerging over three decades, other, parallel application paths have been developing on or near the shop floor under the general heading of "automation."

The oldest is probably the machine tool application. This started with paper tape prepared off line and played rather like a gramophone record to guide the tool's cutting heads. It was followed by CNC (computer numerically controlled) systems so that today a part can be prepared using a small screen and keyboard mounted on or near the machine.

The data is held in a semiconductor store and the operation managed by a micro or minicomputer.

The other major application areas are at the two ends of the production process—designing and draughting on the one hand and testing at the other.

Computer aided design (CAD) started with relatively simple screen and keyboard systems which were a more productive alternative to paper and pencil. Drawings can be compiled with great convenience on the screen, with easy manipulation and modification and the final result produced from the electronically stored data on a high speed large-paper plotter.

But just as industry—particularly in Europe—was coming to terms with CAD, other ideas bearing yet more acronyms began to emerge.

In CAE (computer aided engineering) for example, enhanced CAD techniques allow three dimensional colour representations of components and their assemblies to be viewed on the screen. These 3D machine pictures can often also be animated to check, for example, clearances of moving parts. Such problems come to light at a glance, not after 30 minutes spent gazing at drawings.

Other CAE programs on offer allow system dynamics to be analysed, fatigue life to be estimated, stress distribution to be seen in colours—the list is considerable.

A further development is CAM, computer aided manufacturing, in which the CAD technique is extended to provide on screen or printer listings and grouping of parts, materials requirements, tool paths for NC machines and similar data.

A typical Hewlett Packard data collection terminal in which information is being extracted from a document using a bar code reading "wand" on the production line. This kind of equipment, together with process control systems have recently been supplied to Redfearn at York and Barnsley where bottles and jars are made, and to Sabena, the Belgian national airline.

Meanwhile, the computer has made itself felt in automatic testing equipment, ATE. Most of the ATE action has been in the electronics industry where for some years it has been physically and mentally impossible to test printed circuit boards that might contain, say, 50 integrated circuits each containing perhaps 0.25m transistors.

Clearly, the "testability" of such a board is something that has to be considered in detail at the design stage. Thus, data links between CAD and ATE have begun to appear—GenRad's CadMate is a good example. GenRad testers can be connected to equipment made by important CAD makers such as Computervision, Applicon, Scientific Calculations and Britain's Racal-Redac.

It must be only a matter of time before other such links are established until eventually the automatic factory becomes a reality.

Recently consultants Arthur D. Little held a London meeting for chief executive officers and their immediate aides at which the prospects for CIM—computer integrated manufacturing—were discussed.

The essence of CIM is a database that is common to all possible computer aided functions and machines containing computers. Design, manufacture and test at all levels of technology, administration, organisation and personnel would be covered. As A. D. Little executive Irvin Krause puts it: "There is hardly any aspect of operations that CIM leaves unaffected."

There are immense difficulties, however, to be overcome before this kind of thing can happen. They embrace management comprehension, planning and implementation and include, of course, trade union acceptance.

Such a factory might incorporate CAD, CAM, CAE, FMS, CNC, robots (now about to grow electronic eyes), machine maintenance, materials handling—quite apart from the basic production control and planning computers exercising financial control.

CIM implies the ultimate integration of all those databases into a unified whole so that no matter what aspect of the total production operation is involved, immediate updated information is available to everyone.

That is what organisations like A. D. Little and GE in the U.S. are now turning their attention to. But there is a long way to go yet.

Geoffrey Charlish

Increase in computerised freight scheduling

How computers help to cut distribution costs

THE TRANSPORT and distribution of freight is one of the most costly and potentially inefficient operations that management has to tackle. It is also one of the most complex if done efficiently and it is this complexity, with the high number of variables, that makes distribution a suitable candidate for computer technology.

Almost £20bn was spent by British companies and the national rail and inland waterway networks on freight transport and distribution in 1981, the latest available government figures show.

This substantial cost is generally regarded as an overhead by manufacturing companies and its reduction, like all overheads, is a prime target for management action.

Computers can help in a variety of ways, but the objective is to get the goods from factory to consumer at the least possible cost. This is the ultimate aim of the various computer programmes and packages available to provide "vehicle route scheduling."

The problem these programmes are designed to tackle is far more complex, however, when it is examined in detail than at first appears. In the simplest case, where one factory is providing goods for one shop, the task of finding the cheapest route for the vehicle or train is not complicated by a host of other variables that cloud the issue in the greater complexity of the real world.

In this straightforward case, the vehicle operator would generally choose the shortest distance between the two points. This could be done without computers.

But as the distribution problem becomes more complex with a variety of sources for the goods or materials and a range of destinations, computer techniques start to come into their own.

This is because computers are able, through their huge memories, to cope with the large number of variables involved in a more complex distribution operation. This is not to say that computers and the programmes that have been written for vehicle route scheduling have perfected the ideal freight distribution system; far from it.

The problem is still immensely complex, even for advanced computers.

There is no perfect solution awaiting the freight distribution manager who wants to deliver goods to 20 or 30 towns from a range of depots dotted around the country using the shortest possible distance to visit each town at least once.

Nor are there perfect solutions to the associated problems of taking account of vehicle maintenance costs incurred in operating a route network that may vary in the demands it makes on the vehicle. There are other variables too, which the distribution manager can ill-afford to ignore if he wants the most efficient and cost effective distribution system.

Computers, with their huge memories, can cope with the large number of variables in distribution operations.

In particular, the distribution manager needs to take account of vehicle performance, fuel consumption, components on the vehicle which are susceptible to failure under particular operating circumstances and analysis of information made available from the on-board tachograph vehicle and driver performance meters called for by law for most commercial vehicles.

A further variable is overlaid this already complex system of network distribution operations by the need for the company to ensure that the drivers conform to the statutory drivers' hours regulations introduced under European Economic Community regulations. Under these rules, drivers are allowed only to drive for a fixed length of time in a day, in a week and for a limited time continuously.

The distribution manager also had to take into account the needs of the customer. The customer is likely to have a variable demand for goods or materials; this will need to be reflected in the choice of an appropriate size of vehicle for the task in hand. Also the customer may have his own constraints in terms of demand for his products or available storage space.

Information on all these variables, where it is readily available, will help the freight distribution manager to define his minimum size of vehicle fleet.

Despite teh complexity of the problems involved, and the difficulty of solving them perfectly, a number of algorths, or different mathematical procedures have been devised to help improve the efficiency of freight distribution.

One of the most useful layman's guides to the subject "An introduction to computerised vehicle scheduling" is published by the research branch of the Institute of Grocery Distribution, at Watford.

The guide was written primarily for large wholesale and retail distributors who could benefit from more efficient scheduling of deliveries to small shops and stores. But as Mr Andy Robson, the author of the report says, it "would be of interest to anyone involved in transportation and distribution."

The report points out that as well as financial models for day to day operations, such as total distribution cost simulation, or customer service monitoring models, like demand forecasting or inventory control, more sophisticated models are in use for tactical and strategic decision-making.

The problems of depot location, vehicle scheduling and fleet maintenance are now quite extensively modelled, according to the report, and "there is an ever-increasing use of these analytic models in the day-to-day management of physical distribution."

In a survey of data processing in the grocery trade, one of the more demanding areas of freight transport and distribution, the Institute of Grocery Distribution showed that, five years ago, 86 per cent of respondents to the survey used computers in warehouse stock control, while only 30 per cent used computers for vehicle scheduling and 20 per cent used computers for the siting of depots.

Lynton McLain

COMPUTERS IN BUSINESS XI

Geoffrey Charlish highlights the electronic revolution in retailing

All change at the checkouts

IT WAS recently predicted by a point-of-sale research organisation called Post News that from next year, until at least 1987, some 80,000 electronic terminals will be installed annually in Britain's supermarkets alone, another 20,000 going into smaller outlets.

Even at an average price of say, £1,000, this represents £100m of business annually for equipment makers — quite apart from units that will be installed by other small traders, the department store, restaurant, filling station, newsagent, travel ticketing and other specialist markets. In all, there are about 100,000 retail outlets in the UK alone.

Another prediction, by market researchers Larsen Sweeney, is that the European market for electronic cash registers and point of sale terminals will rise to £700m in 1986, growing at 10.6 per cent a year. The UK alone will account for £105m. says the company.

So it is little wonder that there are some 35 companies in competition. They are offering units that range from simple "stand-alone" electronic cash registers (ECR) through to powerful multi-terminal systems with extensive data capture and memory facilities, often able to support a laser scanner for reading product bar codes.

POS terminals first began to appear in the late 1960s, in the days of the big computer in a central location. So early systems used simple keyboard terminals unable to remember anything or manipulate much data, linked to local or remote mainframe computers. It was neither very efficient nor cost-effective.

But cheap logic and memory "chips" began to make themselves felt in the 1970s and the microprocessor made its debut in 1972. It became possible to house intelligence and memory in stand-alone terminals which referred to distant mainframes only for management/corporate purposes.

Another research firm in this area, Retail Management Development Programme (RMDP), believes that POS terminal prices are now, in real terms, about a third those of the early 1970s. Inevitably, more and more of these devices will be seen on shop counters.

Point-of-sale systems have various financial benefits. For example, by discovering sales trends quickly, operators can

> **'... from next year until at least 1987 some 80,000 electronic terminals will be installed annually in Britain's supermarkets alone ...'**

stock only with appropriate items, raising sales levels. By the same token, stocks can be minimised. Both clerical and accounting costs can be kept down and bad debt levels reduced.

Today, there is something to suit almost any retail outlet. The simplest ECR, at a few hundred pounds, will offer cash collection and relatively simple analyses of sales but no communications to other parts of an organisation.

Often it will be factory programmed by the maker to suit specific kinds of business (newsagents, for example). Frequently "add-ons" are available to allow prices to be looked up and sales data to be recorded.

Beyond perhaps £2,000 or so, and in the somewhat larger shops, "slave" terminals will be found reporting to a "master" terminal containing the bulk of the intelligence and memory. At day's end, the master can empty itself down a phone line to a remote computer for corporate data mustering.

At this point the top end of the ECR market has met and overlapped the bottom end of the original point of sale market.

Towards the £5,000 per terminal top end of POS, however, are the so-called "clustered" systems with large numbers of terminals in supermarkets (where one in five checkouts will probably be using laser scanners by 1987) and department stores. The terminals work to an in-house computer capable of storing and manipulating very large amounts of diverse data.

Such systems are fully programmable, have management terminals, fast report printers, rigid disc stores and probably on-line communications to warehouses, other stores and headquarters.

Technically, this kind of system is at the sharp end of things and will soon form the interface between point-of-sale and bank. Some terminals already have magnetic stripe readers for the new cards that will be used in the coming age of EFT, or electronic funds transfer.

The idea is simple enough. The customer's card is inserted in the terminal and she keys in her PIN (personal identification number) on a headed customer keypad. Then, the shop assistant keys in the amount of the sale, the computer checks the PIN and whether the customer has adequate funds in her bank account, her bank account is debited and the shop's account credited. It would all be done over phone lines.

A variant proposed by Philips and on trial in France is the "smart" card which cuts line connection costs by

An electronic point of sale terminal from NCR in use at a branch of Army and Navy Stores

recording all the transactions on a solid state plug-in module which is either taken to the bank or rapidly transmitted by phone line at night.

The customer has a card with a chip embedded in it which is decremented by sales and incremented by salary or other inputs to the owner's account. It becomes a form of money.

Although this seems very tidy and convenient, the idea is not without its snags, one of which is that such cards act instantly. Gone is the three-day delay of cheque clearance and there are no weeks of grace as with a credit card.

So there may well have to be a credit element, payment being delayed if the customer indicates, possibly with associated interest charges. Existing credit cards will presumably have to be accommodated.

For the retailer it appears to mean more electronics: he will need a new EFT terminal to work alongside his existing point of sale equipment, although new equipment introductions will no doubt embrace the whole POS/EFT operation.

According to Eric Foster of Spectra Services, a retailing consultant, 65 per cent of UK transactions are still cash, 30 per cent cheque and 5 per cent credit card.

Even at this cash level, Foster believes that if all the cheques and credit cards were replaced by EFT cards, the retailer could expect a 50 per cent saving in payment time and almost 20 per cent in costs.

For the banking community, it all spells out change, uncertainty and expense—the affected parties have to agree and someone has to pay for the terminals.

There was a proposal to run a pilot scheme in Southampton early this year, but it was dropped, largely because although the retailers could see advantages, they were not willing to help with the costs of the trial.

However, the Committee of London Clearing Banks (CLCB) is still taking advice and is expected to report soon.

Useful phone numbers: Post News, 0935 88245; Larsen Sweeney, 0622 670962; RMDP, 0273 722887; Spectra Services, 0734 345585.

Aids for more efficient stock control

Wide benefits for the wholesale sector

THE UK wholesale trade is a natural market for computerised methods since wholesale and cash-and-carry companies operate competitively on high turnover and low margins. Moreover, it is also a sector where wholesalers are under long-term pressures—from the growth of major multiples on the one hand, and the profitability problems faced by food manufacturers themselves.

As the multiple chains continue to increase their share of the market—at the expense of the small retailer—so the wholesalers will face a shrinking market for their services, since most of the big retailers deal directly with the manufacturers themselves.

Small, independent retailers—the sector traditionally supplied by wholesalers—are going out of business at a faster rate than new ones are starting up.

The grocery wholesale cash-and-carry sector provides for about 76,000 small grocers and accounts for one-third of all grocery sales. A decade ago there were over 1,200 wholesalers in the UK but now buying power is held by a few major groups, such as Linfood, Booker-Belmont, Nurdin & Peacock, and Makro.

There are about 350 operating companies in the whole food and non-food wholesaling business. Many of the major wholesalers not only supply small retailers direct but also operate cash-and-carry warehouses so retailers can come and buy their supplies.

One of the aims of the electronic data storage systems now being used is to provide a sales receipt for VAT purposes at the cash point—a receipt that also contains a brief description of the product—without in any way slowing the throughput

> **Given the pressures on wholesalers—with tight margins and high volume of turnover—it is not surprising that the industry is already making use of electronic data storage systems.**

of retailers anxious to get back to their shops.

The second main aim is to ensure tighter stock control so that at no time does the warehouse run out of adequate supplies.

The first criterion for electronic data systems in cash-carry or wholesale warehouses is that they are linked throughout the operation—from goods received right through to despatch or the trade buyer at the cash desk. Many wholesale operations ignore this to their cost.

At the "back door" there should be an on-line terminal to enter the individual product code, the quantity, and cost.

This has the advantage of linking label-printers to the in-house computer so the right number of labels can be produced showing the VAT number, the product code, the selling price, and product description in order to avoid label-switching (a common cause of theft).

At point of sale, the electronic checkout will have the product code keyed in by hand which will automatically retrieve the price. This, together with VAT information and a product description, is then printed on the customer invoice.

The stock sold is also automatically checked off by the in-house computer which, according to the information fed into it, can make up an order by product and supplier for re-ordering.

Moving stock within the wholesaler's warehouse can also be helped by computer control. The computer can help determine where the goods should be stored to facilitate their extraction in the most effective way.

Moreover, as electronic data systems spread throughout retailing, so the wholesalers' computers may receive orders from customers by computer. These will need to be reprocessed by the warehouse computer system into specific orders. This will mean greater attention paid to goods' location, the type of racking used, the destination of the goods, and the delivery schedule acceptable to the retailer.

A new report by the Economist Intelligence Unit on the implications of electronics for retailers suggests that laser-scanning systems "have potential applications at both the front and back door for cash-and-carry wholesalers." It says that if the outer-cases containing products also carried a bar-code (a series of lines which represent a number unique to that particular product) then "this would pave the way for speedier processing at the goods receiving area."

However, the report points out that a different type of laser-scanner needs to be developed from the type used in supermarket point of sale systems. "Given the size and weight of the wholesale packs, conventional slot scanners as used in supermarkets are of limited value because the goods cannot be passed over the scanner," says the report.

Trials have demonstrated that hand-held bar-code reading devices such as "light-pens" are unsuitable in cash-and-carry outlets.

David Churchill

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The U.S. computer industry is equipping itself for battle and vowing that "Made in Japan" will not become the standard label on computers sold in U.S. Above: silicon chip manufacturing plant at National Semiconductor, Santa Clara, California

On this and the following three pages FT writers discuss developments and attitudes in the leading computer nations

U.S. the world leader— and means to stay there

IF 1983 is the year of the computer, then the U.S. must surely be the nation of the computer.

Americans are in love with computers, and their chief concerns regarding computer technology are that the U.S. should stay ahead of the rest of the world in creating ever smarter, ever cheaper, ever more computers.

The computer has become almost as much a fact of everyday life in the U.S. as the automobile. The major growth in computerisation has come through the advent of the low-cost personal computer. With 5m "home" computers expected to be sold this year, the computer is now the largest single consumer electronics product market.

Computers in the home, however, are just one aspect of the explosion in personal computers. According to a recent survey conducted by Future Computing, of Richardson, Texas, 22 per cent of elementary schools and 60 per cent of secondary schools in the U.S. have computers. In some states, such as California, the proportion is much higher. Future Computing predicts that educational software alone will represent a $1bn business by 1987.

Computer literacy is now widely viewed as an essential part of elementary education in the U.S. and there is increasing pressure on parents to provide their children with the opportunity to use computers. Computer summer camps are sprouting up in the place of sports camps; businesses offering computer lessons for children are flourishing; and the average age of computer users is lowering sharply.

> **‘ The computer has become almost as much a fact of everyday life in the U.S. as the automobile. ’**

With so many children becoming computer experts it cannot be long, reason the market analysts, before adults feel bound to catch up—the home computer is a reality. In technology-conscious California, "leading consumers" (the group that leads the trends according to the market surveyors) are two-computer families in which the children typically will have their own computer.

Most of the social influences of computers are seen in the U.S. as positive, providing new personal and business opportunities. But just as the automobile has created social problems such as air pollution, crime and road deaths, so computer technology brings with it some new hazards.

Computer crime is a relatively new phenomenon that the law has yet to adjust to. Recently in California, a group of computer company executives were charged with stealing secrets from their former employer. For the first time, law enforcement authorities were granted permission by the courts to search for the allegedly stolen property in the memory banks of a computer.

Extending the scope of search warrants to cover computer memory is one small example of the many adjustments to the law that must be made to take account of computer technology. Other thorny issues include the patent and copyright protection of computer software and the circuits that make computers work.

INTERNATIONAL COMPUTER MARKET
(U.S.-based manufacturers)

	Number of systems shipped	Cumulative number in use	$m value shipped	$bn value in use
1976	35,800	143,950	6,234	33.3
1977	50,690	190,940	7,214	38.8
1978	88,000	275,490	9,112	46.1
1979	161,070	428,560	10,621	54.0
1980	221,980	641,540	11,252	62.0
1981	330,070	954,810	12,296	65.5
1982	497,190	1,430,300	13,778	73.5
1983	707,450	2,118,850	15,714	82.9
1984	976,940	3,073,890	18,244	94.4
1985	1,250,060	4,299,050	20,579	108.2
1986	1,546,900	5,816,750	23,258	123.4

This is the total of all general purpose computers, minicomputers, small business computers, desktop computers, and "other" systems such as IBM's S/7. Minis used in SBCs are subtracted to avoid double counting.

Source: International Data Corporation.

The root problem is that technology changes too fast for the law to keep up. Although there are laws on the statute that provide protection for individuals and businesses from the misuse of computers, such laws are not designed to deal with the reality today of low-cost microcomputers that are easy to use or abuse.

Computers also pose a threat to personal privacy. Computers provide the means for information gathered legitimately to be collated and perhaps put to sinister, or unacceptable, purpose. Any magazine subscriber in the U.S. can be sure to receive a regular pile of "junk mail" because his name and address has been sold as part of a subscription list. This can be amusing when, as this reporter has, one receives in a single day's mail solicitations to subscribe to a new magazine for executive women, a pamphlet on homosexual health care and coupons for disposable diapers. It is at least heartening to know that not all of the information held in computers is collated or correct.

More serious, however, is the threat posed by the storage of personal credit information in computers. Due either to errors or unresolved disputes, individuals can find themselves unfairly unable to obtain credit. It is a fact of life in the U.S. that it is essential to have a credit "record" on one of the several computerised systems that store such data. To remove a "bad" credit rating from a computerised system is a major problem, although the law now provides individuals with the right to know what their records contain.

Reliance upon computers to perform so many essential tasks, be they business or social, raises the issue of what happens when the computer breaks down. In the not too distant future new technology that provides "fault-tolerant" computers will help to solve these problems. In the meantime, computer failures will cause major inconvenience and sometimes danger. The computer industry is one of the major growth markets in the U.S. economy, and as such is providing employment in increasing numbers. It is not, however, making up for the decline in "smoke-stack" industries and probably never will. Most of the labour-intensive processes that go into building computers do not occur in the U.S. but are exported to countries where labour costs are much lower.

Computers also represent automation of both clerical and manufacturing tasks, and there is a very real fear of computerised equipment reducing the number of jobs available in offices and factories. In California, such fears receive little attention because the electronics and computer industries are major employers.

The major threat, as seen in the U.S. is that the country may lose its dominant position in the world market for computers.

> **‘ Computer summer camps are sprouting up in the place of sports camps; businesses offering computer lessons for children are flourishing ... ’**

This threat comes from Japan. As the U.S. automobile industry is licking wounds gathered in a trade war with Japan, so the computer industry is equipping itself for battle and vowing that "Made in Japan" will not become the standard label on computers sold in the U.S.

In Washington, the trade issue is seen as a part of the broader question of national security. Staying ahead in computer technology provides the U.S. with the ability to build the most sophisticated weapons systems that Defense Department believes. To protect that technology lead, the Administration is prepared to protect the industry from "unfair" competition from Japan.

Government and industry (and even different elements within the Administration) are at odds on how these goals can best be achieved. Most industry leaders favour a free market approach. They want to see the government negotiate with Japan to provide access to that market for American-built electronics and computers. There is a growing feeling, however, in favour of protectionist measures to counter the "Japanese threat."

Administration policies have been sympathetic to the industry's problems, but not always constructive. The Justice Department has turned a blind eye to increasing inter-company co-operation in research and development (that could potentially run up against anti-trust laws). Trade negotiators have made some progress in assuring, at least in principle, that U.S. manufacturers have access to the Japanese market.

On the other hand, the Defense Department favours export control policies that would give it control of export licences on hi-tech goods.

While the goal is to prevent U.S. technology getting into the wrong hands, the proposed procedures could cripple U.S. exporters by creating a log-jam of applications for export licences. Then there are seemingly well-meaning, but misinformed efforts on behalf of the industry such as the Federal Trade Commission investigation into Japanese price-fixing on Japanese-made memory chips (an essential component of computers). While the FTC looks into alleged price-fixing, the industry is struggling to survive a Japanese price war on this product.

In what may provide the U.S. computer industry with a significant boost, however, the Defense Department has unofficially announced the creation of a U.S. answer to the Japanese "Fifth Generation Computer Program." The Japanese program aims to develop a new class of "intelligent" computers with which Japanese manufacturers could take over a large portion of the multi-billion world market for mainframe computers.

The U.S. Defense Department program is titled the "Nth Generation Computer Program" and is directly aimed at countering the Japanese goals.

Louise Kehoe

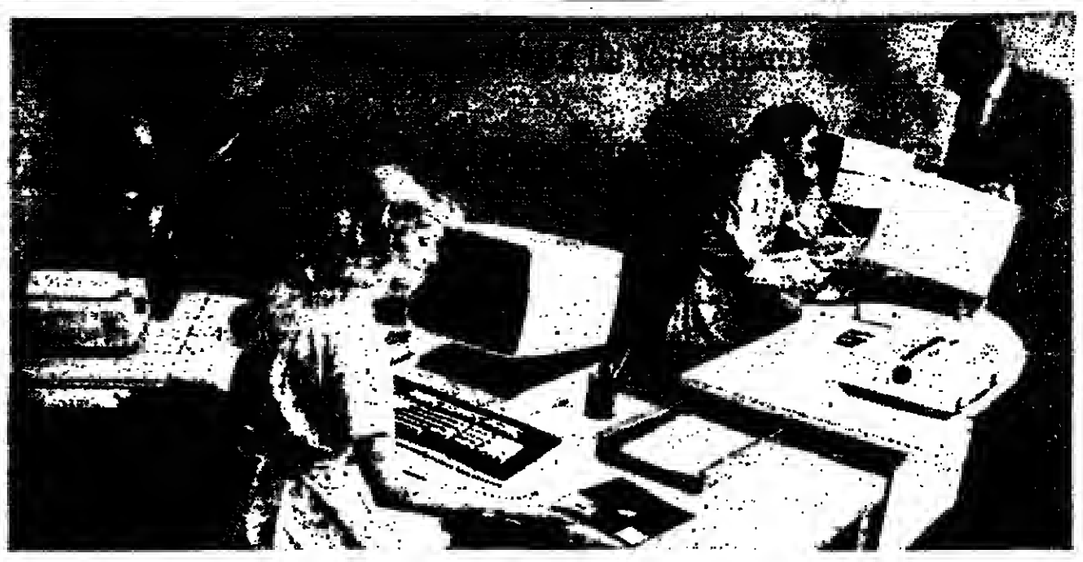
COMPUTERS IN BUSINESS XV

The NCR Decision mate V (seen left) is a single station, personal computer system for the business professional. It spans the information processing spectrum from an 8-bit single processor to dual 8/16 bit processor.

Industry standard operating systems provide accessibility to a broad range of languages and supportive software tools.

Pictured on the right are several of the two new DRS 20 video terminals introduced by ICL.

The DRS 20 series of multi-microprocessor based distributed resource systems provide interactive access to ICL mainframe computers.



The spectacular rise in personal computer sales has happened without denting the mainframe market, reports **Joan Gray**

Micromania sweeps through Britain

MICROMANIA SWEPT Britain last year and shows no sign of abating.

In a rush unequalled anywhere in the world, more than half a million people in Britain bought a home computer in 1982. Home computers were taken up as the latest money spinner by chain stores such as Boots, W. H. Smith, House of Fraser and John Menzies, and promoted like glossy encyclopaedias as your next vital purchase if you want to secure your future.

Britain now has twice as many home computers per head of population as the U.S. and one and a half times as many as Japan; two-thirds of all the home computers sold in Europe are sold in Britain and, encouragingly, most of them are made in Britain as well.

Figures prepared by microcomputer consultant Robin Bradbeer show 459,000 people in Britain bought a home computer costing less than £200 last year—and three of the four market leaders were British. Sinclair's ZX 81 was the clear leader with sales of 220,000; Sinclair's Spectrum sold 75,000, and Dragon Data's Dragon 32 sold 25,000.

The Commodore Vic 20, which at 100,000 had the second largest share of the market, is now to be manufactured in Britain.

Of the 50,000 slightly more expensive home computers sold, costing just over £200, Bradbeer found the clear market leader was another British machine, the BBC Computer, with sales of 40,000.

The home computer boom started three years ago, when Clive Sinclair broke the £100 barrier with his ZX 80 computer. In the face of great scepticism from his competitors, Sinclair financed the ZX 80 development from his own country, convinced that people wanted to know more about computers but could not afford to own one of their own.

"We live in a computer age, and people need to understand computers," he said. "And the best way to do it is to get your hands on one and learn to programme it in the least frightening environment, you own home."

Sinclair's conviction paid off. He is now the world's biggest computer manufacturer in terms of numbers sold, and personally worth £129m.

The UK now has twice as many home computers per head of population as the U.S. and one and a half times as many as Japan.

The rise of the home computer has also revived the fortunes of the ailing toy manufacturer Mettoy, which launched its Dragon 32 computer last August. The company decided to move into the computer business after observing sales of its Corgi toys suffering because its customers were collecting electronic toys and home computers instead.

So Mettoy decided to move with the times, commissioned Patscentre consultants to design a home computer, and launched it to a runaway success. With demand consistently running at double the 3,000 a week it could produce, Mettoy decided to float Dragon Data as a separate company, explains Richard Marshall of Prutech, which helped back the venture.

"The company decided that if you can't be in nomo computers in a big way its better not to be in them at all," he said. "So they put the Dragon in a separate company with Mettoy as a shareholder and the money from the deal helped put new life into the old company, which is now developing a complete new look and advertising for a new chief toy designer."

Such is the spectacular success of the UK as a home computer market that the U.S. company, Commodore, has just transferred its home computer production from West Germany to a new £20m factory in Corby to put it right in the heart of the largest market. It expects to sell nearly half its output in Britain: 250,000 home computers to the UK this year, 300,000 next.

The spectacular rise of the home computer has happened as sales of the more powerful personal computers for businesses have also boomed. Both have grown as complete new businesses, without denting sales of the traditional workhorse computer, the mainframe.

According to Mr Derek Pedder, managing director of BIS Pedder, who is in the throes of completing his latest census of the computer industry, "the small systems business has grown on top of the large systems business to provide a level of computing which was just not there before. It's very much a whole new market, and the mainframe market has not been dented by the personals because you're looking at different requirements."

Pedder's survey is also revealing good news for Britain's own mainframe manufacturer, ICL.

"ICL is getting a bigger markot share and is definitely in a stronger position than a year ago," ho said.

ICL is now profitable again after being bailed out by £200m Government guaranteed loans. But the cost of achieving this return to profitability illustrates one of the biggest problems of the computer industry. With advances in chip technology, making computers is no longer a labour-intensive business.

To return to profit, ICL had to cut 10,000 jobs, reducing its workforce to 23,500. Sinclair's main subcontractor, Timex in Dundee, employs 600 people to make 100,000 computers a month; Commodore will need only 250 people to make up to 60,000 computers a month at Corby; Dragon Data's 12,000 computers a month are made by 80 people.

And the problem is, not only that making computers is no longer a labour intensive business, but that the major reason for using them is often also to cut staff.

Two of ICL's biggest contracts—computers for the Inland Revenue and for the DHSS—will lead to thousands of staff cuts. Computerising PAYE could cause 7,000 civil servants' jobs to disappear; computerising payment of social security benefits could cause up to 25,000 DHSS jobs to go.

The discussion now rages over whether computerisation needs to cause such massive job loss. The debate centres over whether computerisation should be used to cut staff and save costs, or as an opportunity to retrain staff to provide new services.

As Mr David Fairbairn, head of the National Computer Centre put it, "in areas like the Inland Revenue and DHSS where people want problems solved, my recommendation is to use computerisation to make economies on routine administration and then redeploy people to give more effective advice, guidance and service.

With advances in chip technology, making computers is no longer a labour-intensive business. To return to profit ICL had to cut 10,000 jobs.

"We have got to recognise that the non-measurable provision of advice and guidance is a valuable benefit, and not only concentrate on those things that are measurable."

This argument is echoed by the unions concerned. The Inland Revenue Staff Federation wants to see people put not just to giving more advice but also to chasing the black economy. The union argues that this would pay for itself several times over, as staff chasing moonlighters recover up to twenty times their annual costs. It fiercely criticises the Government's approach, which it condemns as doctrinaire concentration on cutting numbers while ignoring new opportunities.

But the Government has introduced a string of programmes to try to make sure Britain does not miss out on the wealth computerisation can bring: programmes such as giving every school a computer, helping industry use and produce computers, and giving unqualified school leavers training in basic computer skills.

But the most important initiative of all could be that suggested by the Department of Industry's Alvey Committee chaired by John Alvey, director of technology at British Telecom. The committee recommended that Britain should spend £350m on a five-year research and development programme to help British companies catch up with Japan and the U.S. in producing and using fifth generation computer systems able to work at 10,000 million instructions per second and to emulate human reasoning.

The aim of the Alvey programme is to make sure Britain keeps up with the latest computer and information technology, and runs no risk of falling behind and becoming just a backward wholesaler, explained Mr Alan Benjamin of Computer Analysts and Programmers.

"Alvey could be a real circle breaker in jobs loss," he said. "It's got the emotional appeal of here is a new attempt by British companies and the Government to underpin e growth industry with real money which will create new jobs and give us a marketing edge."

Automation of all kinds regarded as essential

Positive view in Japan

WHEN CONSIDERING the social effects of computerisation in Japan it is necessary first to bear in mind that the Japanese have long possessed an unusually positive and optimistic attitude towards new technology in general, and that "automation" has only very recently been viewed as something potentially threatening.

The implementation of new technology is strongly promoted by the Government as an essential means of compensating for the nation's dearth of natural resources.

It has also been seen by the Japanese as an important factor behind the successful rehabilitation of the nation's secondary industries and the recovery of international standing and competitiveness after the ruin of war.

Recent successes by high-technology industries in such fields as electronics and semi-conductors have served to reinforce this optimism.

The characteristic Japanese method is to welcome the introduction of new technology into the work place wherever and whenever possible, and to worry about coping with unpleasant consequences as and when they arise.

This receptiveness can most clearly be seen in the case of robot introduction. It is only very recently, and after robots have already been deployed on a scale unparalleled worldwide, that workers in the industries concerned, and the related government ministries, have deemed it necessary to take measures to monitor and regulate their use.

In the office environment, too, automation is increasingly regarded as an essential step and resultant changes in patterns of employment viewed as the inevitable accompaniment of modernisation for which new responses must be found.

A study of visitors to a major Tokyo business show in 1982, made by the Nippon Administrative Management Association, revealed the extent of these positive attitudes.

Asked for their first impression of office automation (O/A), 36.7 per cent of respondents expressed the view that it was

Government and business leaders speak with confidence of the opportunities for new forms of employment made possible by new technology.

"good for enterprises because managerial effectiveness is promoted," while only 5.8 per cent mentioned concern over its effect on employment among white-collar workers.

Although data concerning the level and the effects of computerisation in the business world are scarce, recent studies have indicated an accelerating rate of introduction of O/A equipment and an associated decline in overall employment levels, especially among women workers.

In a survey released last year by the Labour Ministry, 81.9 per cent of a sample of 398 large-scale enterprises stated that, by the use of O/A equipment, they had achieved the goal of holding down the number of workers in the clerical and administrative sectors, in the period from 1975 to 1981.

The total workforce of these enterprises grew by 3.1 per cent during this time, but the percentage of women workers fell by 4.3 per cent, against a 6.1 per cent rise for male workers.

Asked about prospects for the next five years, a majority of 48.7 per cent of companies said they expected a decrease in employment in the above sectors, principally achieved through reduced recruitment and non-replacement of vacated posts.

Government and business leaders regularly speak with confidence of the opportunities for new forms of employment made possible by new technology, yet within established businesses the principal concern is often found to be the rationalisation of staff levels, with computerised operations enabling the necessary increase in efficiency.

Behind this trend is the fact that personnel expenditures are invariably the biggest outlay faced by large Japanese enterprises, which are bound by convention to reward employees by seniority of age rather than by productivity, and to offer full-time staff lifetime employment benefits.

Many companies, hard-pressed by the recession, are now utilising O/A equipment to free full-time male staff from non-productive office work, and re-allocate them to active sales positions. Meanwhile women, whose employment is typically on a more temporary basis, and less well paid, are frequently being channelled into the computer-equipped office jobs. As it is these office tasks which are being most effectively rationalised, the female work force is gradually being seen to decrease.

As an additional result, young women seeking jobs are increasingly finding it necessary to offer O/A skills; in particular the ability to use word-processors, which are spreading very quickly with the arrival of improved Japanese language software. Some new, computer-related opportunities for employment are arising, notably in the software industry.

Male software engineers are in seriously short supply in Japan, and this has increasingly led major electronics companies to recruit women college graduates. The demand for women in temporary office positions, using computerised equipment, is also growing fast, and staff agencies are enjoying a new market for women with O/A experience.

Problems in the software industry are not confined to

A particularly thorny issue, under review by the Finance Ministry, is the introduction of electronic and home banking.

staff shortages. A 1982 study of 6,000 workers in small- and medium-sized data-processing service companies found that because of difficult and strenuous working conditions about 70 per cent of computer programmers and systems engineers below the age of 28 want to quit their jobs by the time they're 35, and 30 per cent reported serious work-related illnesses within the preceding year; further reason perhaps for viewing the field as a young person's calling.

Progressive in O/A introduction is fast-moving, but there remains a heavy reliance on the written word and telephone

Japan's receptiveness to new technology is most clearly seen in the case of robot introduction, as in vehicle production, above. Now, in the office environment, too, automation is regarded as an essential step forward by large scale businesses.

communications in the Japanese business world. One recent estimate put the cost of paper documentation in the single area of foreign trade transactions at Y2.5 trillion annually.

The Japanese fondness for handwritten business messages is one reason for such inefficiency, but a factor of wider, and growing, significance is the political battle over the liberalisation of data communication services being fought between the Posts and Telecommunications Ministry and the Ministry of International Trade and Industry (MITI).

A monopoly on data and information transmission circuits is held by the government-capitalised Nippon Telegraph and Telephone Corp. (NTT), and the international communications carrier KDD.

MITI, representing the views of a wide cross-section of industry, is seeking the total liberalisation of on-line data processing, with restraints introduced only where necessary to maintain orderly business. The P. and T. Ministry prefers to move in the opposite direction, maintaining its overall controls and issuing licences on an individual basis.

Some measure of compromise has been reached through revisions of the Public Telecommunications Law, the most recent of which, last October, allowed enterprises with a maximum capital of Y100m, and specific inter-business relations, to engage in VAN (value added network) services.

Generally speaking, however, the use of circuits by private circles is still confined to computerised "information processing," while "communication services" for the sending of transaction information is restricted.

The P. and T. Ministry has also expressed concern about the "sovereignty" of Japan's internal communications services, if liberalisation is allowed. MITI here again takes the opposing view, stressing the importance of improved foreign access to the Japanese business world, at a time of serious trade friction.

A particularly thorny issue, now under review by the Finance Ministry, is the introduction of electronic and home banking. The traditional banking services fear that outside monetary institutions such as credit companies and postal savings organisations could undermine their position by use of data communications facilities, if controls are not maintained.

On the other hand, excessive efforts to co-ordinate the moves of the mainstream banking organs might damage their competitiveness. Banks are also worried about heavy computer equipment investments, the problems of maintaining user-confidence over the question of data protection and the effects placing computer terminal units in homes and businesses could have upon the traditional role of the bank counters.

Employment levels in banks have fallen as fast as anywhere, especially through computerised teller service equipment. Toshiba Corporation has just launched a new range of bank-note handling machines, capable of counting and sorting 600 notes per minute, an example of the continuing improvement in streamlined banking operations, which promises to affect staff levels further.

However, despite the increasingly apparent problems computers are bringing to Japanese society, optimism prevails. A leading industry watcher, Professor Shoji Tanaka of Tokyo University, put it this way: "The negative effects of automation are emphasised too much—we must find a new way of life, a new way of production, after the introduction of new technology. We Japanese believe we can do that."

Roy Garner,
Tokyo

Business market for small machines boosted by the government

French learn to love computers

FRENCH BUSINESSMEN, wooed by government promotion and an increasing number of foreign electronics manufacturers bursting on to the market, are learning to love computers.

Hampered by an inefficient distribution network and a contradictory profusion of government-backed information technology campaigns in the past, France has been a relative laggard in the computerisation stakes compared with the UK and West Germany.

The signs are that this is now changing. Although sales of large mainframe computers—where the market is dominated by IBM and the heavily loss-making nationalised CII Honeywell Bull—are growing at a relatively staid pace of about 10 per cent a year, the business market for small computers is booming.

According to the market research organisation Intelligent Electronics, which has carried out surveys of the main European computer markets, French sales of microcomputers for business and professional use are expected to reach 85,000 units this year and 115,000 in 1984, against 52,000 last year, 32,000 in 1981 and only 16,000 in 1980.

Computer manufacturers speak of a growing trend towards installation of machines in small businesses or in decentralised departments of larger companies. Marketing efforts are being aimed less towards computer specialists and more towards businessmen themselves as the end user.

France's wide-ranging network of computer servicing and software companies—many of them small, local concerns in an excellent position to assist the computerisation of small firms—is certainly an important support in the Government's efforts to propagate information technology.

"We are going to become more and more a marketing company," says M Bernard Molland, distributors' sales manager at CII HB.

The state-owned company, traditionally concentrated on mainframe manufacturing, has just restructured its operations to put greater emphasis on microcomputers, where its chief products are the Micral/Questar range.

Software houses play an important part in CII HB's indirect sales network, through distributors and agents around the country. "Up to now, computing has always been a technical world," says M Molland. "Now, we are not exactly selling soap—but it's something like it."

M Alain Beurdeley, marketing director of the information systems division at IBM France—which is reputed to have about 50 per cent of the total French computing market—says that up to two or three years ago, few small businesses of less than 200 employees were interested in computers. "Now,

Total spending on French information technology in 1981 was about 6 per cent of world expenditure.

with the entry of higher-performance machines, the market has become dynamic."

IBM's own personal computer, introduced in Europe at the beginning of the year, itself is expected to lead to a revolution in the French business computer market. Together with the expected introduction in France of Digital Equipments Rainbow business model, the new entrants should pose strong competition for the present market leaders in the French business computer sector, Apple and Commodore.

Intelligent Electronics estimates Apple took 23 per cent of the market for business micro-computer sales last year. Tandy and the main French manufactured products—Goupil, Micral and Logabax—also had significant percentages, as did Hewlett Packard and Sharp. The organisation says that early indications on the success of the IBM model are "very promising," and this unit should become the market leader in the French business sector.

A recent report from the Government's Planning Commission estimates that total spending on French information technology in 1981 was about FFr 40bn or 6 per cent of world

CONTINUED ON NEXT PAGE

COMPUTERS IN BUSINESS XVII

How the French see it

CONTINUED FROM PREVIOUS PAGE

expenditure — putting the country in fourth place behind the U.S. (54 per cent), Japan (8.5 per cent) and West Germany (7.5 per cent).

In individual areas, such as the introduction of computers in schools, France is lagging far behind its neighbours.

The Government's aim under its ambitious electronics programme is to hoist France up to the world's third largest electronics power by the end of the decade. A controversial report recently drawn up by M. Philippe Lemoine, a civil servant in the Industry Ministry—not yet officially published—showed that France still has a long way to go.

France's share of the total European computer market fell to 19.5 per cent in 1981 from 20.7 per cent in 1978, well behind West Germany with 26.6 per cent. The report pointed out that, according to certain studies, the French share could fall to 17 per cent by 1985, in third place behind Germany with 30 per cent and the UK with 20 per cent.

The Government is trying to make up the lag by putting increased sums into key projects such as computer-assisted design, education, translation apparatus and the establishment of a large industrial and scientific computer.

Small projects which catch the eye abound. Recent examples include plans to install computers to aid travellers on the Paris Metro; and a computerised information system for estate agents.

The Government expects that by 1985 each French person will come into contact with a computer 10 times a day, compared with just twice a day in 1978.

A proliferation of government agencies exists—too many, according to the Lemoine report—to try to promote "informatisation." The Mission à l'Informatique is the government's main arm implementing the preferential purchasing policy in favour of French equipment in the administration and public enterprises.

But the most important tool to promote the wiring-up of small businesses is the Agence de l'Informatique, a public agency set up in 1980 to bring the electronics sector into contact with end users across the whole of manufacturing and service industries.

Last year the agency spent FFr 265m on promoting information technology, including industrial applications such as robotics. Most of the money was spent on research and development, and grants—on which the agency receives royalties in a subsequent year—to companies and industrial federations purchasing computer equipment.

According to government statistics, in 1980 about 67 per cent of large companies used computers for accounting and personnel matters, a percentage expected to rise to 92 per cent by 1985.

> Computers are spread most strongly through small businesses in the wholesale trade.

Penetration in companies' distribution departments was 47 per cent (rising to 76 per cent by 1985); 37 per cent in production management (rising to 71 per cent) and 34 per cent in purchasing (rising to 71 per cent). But the rate of usage in research and development was only 24 per cent and in documentation 11 per cent—although the percentages are expected to rise strongly, to 48 per cent and 51 per cent by 1985.

Computer manufacturers make a point that small companies, in particular, are becoming computerised not only to increase productivity and save costs during the recession, but also to economise on time and energy. The proprietors of many small family-run companies in France have not benefited at all from the Government's cuts in working hours. The *patron* simply get fed up with working overtime on repetitive bookwork—one of the strongest sales points for computers, according to one marketing manager.

A newly-published survey from the Compagnie Bancaire banking group underlines that, whatever the precise reason, small businesses are indeed jumping very quickly on to the computer bandwagon. The results of a questionnaire sent to 22,000 small companies of between 10 and 200 employees (out of the 100,000 or so of this type thought to exist in France) showed that 36 per cent had their own computer in 1982 against only 25 per cent in 1981—and the percentage is expected to rise to 51 per cent by the end of 1983.

The survey showed that cuts in costs—most companies recently computerised bought equipment for less than FFr 70,000—represented the main factor behind the jump. The biggest growth rates expected for this year are coming from the smallest enterprises of fewer than 50 employees.

Computers are spread most strongly through small businesses in the wholesale trade, with about 60 per cent wired-up last year. Most remains to be done, however, in the building and public works business, where only 22 per cent were computerised.

Significantly — and showing that there is indeed a link between government intervention and the needs of the market—the construction sector is one of the chief areas where the Agence de l'Informatique is concentrating its promotional efforts.

David Marsh

COMPUTER USAGE IN FRANCE

This table indicates the increasing percentage of smaller systems valued at FFr 50,000 to FFr 250,000.

	Total number of French computers installed	The number valued at FFr 50,000 to FFr 250,000
1971	13,016	6,680
1972	16,226	8,982
1973	20,915	12,963
1974	26,380	18,187
1975	31,453	21,423
1976	36,670	25,461
1977	44,389	31,997
1978	51,716	37,572
1979	60,988	44,240
1980	74,406	54,553
1981	94,035	67,995

Source: Government Planning Commission

Comecon picture is of an extremely patchy performance, says **Anthony Robinson** in Moscow

Soviets struggle to keep up

THE LARGE scale computerisation of Soviet industry and the mass introduction of computer-controlled robots is seen by Soviet planners as one of the best ways of increasing the productivity of labour and capital.

The urgency of the task has been increased by demographic trends which see a progressive decline in new entrants to the labour force over the present decade and beyond, and by *growing concern over the* diminishing returns achieved by the investment of capital.

Development of computers and robots has become one of the priority tasks of Comecon co-operation, with the Soviet Union concentrating on the production of main frame computers and industrial robots for heavy industry. East Germany and Hungary are forging ahead with micro-computers, while Bulgaria is concentrating on floppy disks and soft-ware.

The introduction of computers throughout Comecon is lagging way behind the West and the gap appears to be widening as the pace of development in Japan, Western Europe and the U.S. takes Western industry into ever more sophisticated fields.

The gap is especially large in the service industries which are themselves a generally backward area.

The banking and retail distribution systems, which are big customers of computers in the West, are still at a primitive stage in most Comecon countries and particularly in the Soviet Union.

Checking accounts, for example, are unknown to Soviet bank customers, even for foreigners holding hard currency accounts in the foreign trade bank.

The abacus is still the main accounting device, not only in shops but also throughout industry and commerce where millions of people are employed painstakingly preparing accounts, work schedules and calculating wages and bonuses by hand.

Clearly, however, the use of computers is much more advanced in certain specific sectors of Soviet industry—and especially the military economy which is the largest and most developed single sector. A country which can maintain a sophisticated space research and development programme, build sophisticated missiles and aircraft and strive continuously to achieve strategic parity with the United States needs sophisticated computers to do so.

Practically nothing is known, however, about this huge sector which operates in the strictest secrecy.

Western computer experts believe, however, that many of the computer systems working in the most sophisticated sectors of the Soviet military economy are essentially hand-built, special purpose machines incorporating significant amounts of Western technology, some bought openly, but much of it imported clandestinely to avoid Cocom restrictions.

The general picture which emerges in sometimes surprisingly frank discussions of the problems affecting the introduction of computers and computer-linked technology into Soviet industry is that of an extremely patchy performance with considerable reluctance among many traditionally-minded managers to adapt to the new techniques required if computers are to be effective.

> A country which can maintain a sophisticated space research and development programme, build sophisticated missiles and aircraft . . . needs sophisticated computers to do so.

In January last year, the Siberian branch of the Soviet Academy of Sciences held a fascinating round table conference to which it invited the directors and leading specialists at the enterprises and research institutes of the Ministry of Machine Tool Industry, the Ministry of the Electrical Equipment Industry, the Ministry of Instrument, Automation Equipment and Control Systems and various research institutes connected with the Soviet Academy of Sciences.

Mr Victor Kabaidze, manager of the Ivanovo Machine Tool Association which produces inter alia multi-purpose numerically controlled machining centres, frankly admitted that the Soviet machine tool industry is 10 to 15 years behind the West and warned: "The world won't wait for us. Every year brings a new generation of electronics. We need to find ways of getting new machine tools into production fast and provide economic incentives for doing so."

The question of incentives is now at the centre of a wider debate aimed at trying to reform the nature and value of output and introduce a more sophisticated set of indices which encourage rather than discourage innovation.

One result of the present system of planning indices and bonuses is that Soviet machine tools are much heavier, as well as much more primitive than their Western counterparts, and to have any chance of export they must be fitted with imported electronics.

The conservatism of many Soviet machine tool manufacturers was underlined by the director of the Ivanovo Carding Plant who told the round table that they needed automated lines three times as precise as those available from existing Soviet machines and finally had to buy 60 such lines from Switzerland.

"There is still some machinery that we have been trying for 30 years to order from Soviet industry, but still can't get," he added.

Part of the problem is that Soviet industry is organised on the basis of huge, multi-purpose plants and combines with a virtual absence of the kind of small and medium-sized specialist companies which have proved to be the main vehicle for rapid technological innovation and computerised systems in the West.

Research institutes, of which there are a vast number employing a huge number of scientists and technicians, are also frequently ivory towers, out of touch with the needs of industry, even though their members often display excellent awareness of the trends and achievements of the Western computer industry, obtained through western specialist publications and other channels.

Nikolai Smirnov, chief designer of numerical control systems for the Ministry of Instruments, Automation Equipment and Control Systems, analysed the task facing the Soviet industry: "It is time for us to shift from numerical control equipment that employs relatively little integrated circuitry, and change to broad capability equipment that employs micro processors, large integrated circuits and micro-computers.

"Such equipment has been designed and is now being put into production . . ." At this point, however, he was interrupted by Academician Agangegyan, perhaps the most brilliant and outspoken of contemporary Soviet economists, who added sharply: "Your systems are not dependable enough."

> Glory to the Soviet microchip—the biggest microchip in the world?—a Soviet official's wry propaganda slogan.

When Mr Smirnov attempted to refute his critics by saying that they were "not much worse than imported equipment" one of the users of his machines added: "An analysis of pertinent information shows that there have been numerous complaints about numerically-controlled machine tools. Most of the downtime is due to breakdowns in their electronic systems."

At this point, Mr Smirnov came back with the view that "we cannot hope to develop the best numerical control systems when it takes years to get industry to start producing the necessary electronic components . . . even though we will finally be getting improved memory components in the near future, the capability of our computer units is still too low to bring us up to world standards."

"The rated capacity of the micro-computers we have to work with is low, only 40,000 operations per second and their capacity in operation is even lower," Mr Smirnov added.

Having revealed the low capacity and effectiveness in operation of the basic components another expert, Mr Margolit, Laboratory Director for the Ryazan Machine Tool Association, went further to criticise the effectiveness of the Elektronika NT-31 machines which have been presented as the acme of the Soviet computer industry.

"Because of the exaggerated claims for the Elektronica, some excessively optimistic conclusions have been drawn as to the sophistication of the electronic components that are available in our country," he said. "The claim that NT-31 is a real time control system is illusory.

"In reality, it is nothing but a traditional numerical control system that's harder to program. I think that the NT-31 developers mindlessly copied experimental models put out by leading Western firms."

Old fashioned, unreliable components and the slowness of Soviet industry to respond either to the demands of computer users or world trends are only some of the problems, however. The innate conservatism of so much of Soviet industry and the inability or reluctance to introduce modern management methods is perhaps the most basic problem—and the most difficult to eradicate.

This is becoming apparent as Soviet leaders exhort Soviet managers to develop and quickly introduce computer controlled robots.

A recent article in Pravda stated: "The rapid progress of this technology is being impeded by a shortage of scientists and designers and a persistent under-estimation of the role of robots in carrying out the comprehensive mechanisation and automation of equipment and production processes."

All in all, the development and introduction of computers and computer-related disciplines into Soviet industry seems to be fraught with enormous difficulties which are intensifying the need for thoroughgoing reforms of the entire planning system and the attitudes of labour and managament.

The sense that Soviet industry is lagging behind and is likely to lag even further behind is summed up by the following apocryphal story told by a Soviet official.

Propagandists were looking for a slogan to encourage and stimulate the Soviet computer industry.

Finally, they agreed on a slogan. It ran: "Glory to the Soviet micro-chip—the biggest microchip in the world."

COMPUTERS IN BUSINESS XVIII

Here, and on the next two pages, specialists highlight the main advances in hardware and software, and indicate the trends

Advances in hardware

EXCITING THOUGH it is to look at the work being carried out in the laboratories of the major computer manufacturers and their suppliers, such a view will not give us a clear picture of hardware developments.

The trail from the research and development leboratory is a maze of dead ends and false starts which is littered with promising technology that never found a sizable place in the marketplace.

There are nine developments in the marketplace, however, which, taken together, clearly show where computer hardware is going over the next five years —that is as long as a hithgerto discounted technology does not come along and steal the thunder of more pedestrian technologies now under consideration or under production.

It is instructive to bead the list with e disappointment in one of the most neglected but fundamental areas of computer technology—the methods of presenting data to the user.

Little has come on to the market to take advantage of flat screen technologies.

The industry has standardised on the cathode ray tube, used in domestic televisions, for a long time now. Indeed the length of the tube determines the length of many products, like personal computers and terminals.

Little has come on to the market to take advantage of flat screen technologies to follow up Burroughs' screens used on small business machines over eight years ago. Grid Systems, a fast growing U.S. company, has produced a portable computer with a flat screen and Olivetti has plans to do so. But other manufacturers are still dependent on cheap cathode ray tubes, made by the handful, to provide that essential visual link with professional and non-professional users.

Continuing the theme of ease of use and presentation, keyboards designed with some thought for the operator are at last being offered by vendors, many of whom have been influenced by the designs of Scandinavian supplier Ericsson.

Wang's new Professional Computer, for instance, has the type of keyboard that professionals and typists will find easy to usa.

The standard data processing keyboard is still, however, governed by outdated designs which rely on the manual typewriter for their inspiration. In the past two years memory chips which store 64,000 bits of data have become the standard memory products.

Fearsome competition between U.S. and Japanese suppliers has driven the price down to a level and in volumes sufficient to appear in every computer product.

These memory developments pave the way for corresponding developments in the processors made by using the same Very Large Scale Integrated (VLSI) manufacturing processes. VLSI techniques allow chip manufacturers to build processors which can take a word length of 32 bits, for years the standard for mainframe computers and only recently achieved by minis.

A greater word length allows the designers to establish a more complex instruction set and allows the processor to shift greater blocks of data faster.

Commercial products incorporating 32-bit processors are now coming onto the market, led by Hewlett Packard, which continues to keep its chip developments in line with the industry's best.

Several chip vendors are taking the intermediate step to 32-bit working processors by providing the power through a set of chips instead of a single chip. All this provides more computing power in which to bury the relative inefficiencies of software development, giving users more functions.

The continuing production and design developments which underlie chip memory capacity increases and more powerful chip processors are also opening up an avenue of development of system vendors which has a knock-on effect right throughout the industry.

Processor architectures which have become commonplace and for which there is a lot of software available. such as Digital Equipment's PDP 11 range of minicomputers, are now being implemented in small chip sets.

These can be used to provide processors for small business systems or can be attached to machines providing control functions. Taking established processor architectures down into silicon creates a stability in computer usage which has meant that the vast investment in existing software can be transported across a whole range of processor powers with little or no amendment.

The rewards of these chip developments would be lost if peripheral devices such as storage units and printers were not also being enhanced in speed and function. Faster processors would, without faster storage, spend most of their time sitting idly waiting for the last instruction sent to the storage device to be completed.

Development staff at work in Honeywell's Systems Division at Hemel Hempstead

With the development of complex and very large pieces of software to run databases, users are moving across to true online systems which can provide access across a range of data to the user's terminal on request.

Most of the data held on a computer has therefore to be available within thousandths of a second to the processor if requests from terminals are to be serviced within an acceptable waiting time. Thin film technology is a major development in disk drives, which provide the storage medium for large databases.

IBM has begun the volume shipments of its 3380 range of thin film disk drives which give access to 2.52 gigabytes (billion characters of storage) with an average seek time of 16milliseconds.

The companies imitating IBM's technology, the plug compatibles, have also worked hard at getting thin film technology out to users and they have begun shipments of their new disk drives.

These developments will allow still greater amounts of data to be held online for immediate access and will eliminate some of the production bottlenecks which large users face.

Right at the other end of the spectrum, in the personal computer market, the existence of the floppy disk drive has been an essential component to the growth of the market. Data is stored on a flexible disk about the size of a single record which is kept inside an envelope.

Storage capacities for these disks have been doubled as the read/write heads inside the drive have become more sophisticated. The whole size of the drive has also been shrunk so that multiple drives can be integrated into a complete microcomputer.

Many of the personal computers now being bought for business use will have to communicate with other personal computers or larger computer systems to get or send essential data.

Communications hardware is therefore an important area of development, especially the communications hardware to get small and medium-sized computers talking to each other when they are in the same building. These local area networks are still an area of considerable standards debate, often held at a level of obscurity common to theological discussions.

Large orders for local area networks are, however, now being placed, a sign that customers both need the solutions on offer and are willing to make their own choice while the standards are still under discussion.

A UK order for £2m worth of local area network systems to link up parts of the air traffic control centre is just the beginning.

First shipments are also being made of a new generation of private automated branch exchanges, PABXs, which are based on computer technology and are equally at home processing voice messages or data messages.

The UK market for these PABXs has not yet been lost by UK vendors, unlike many other information technology markets where early UK leads have been whittled down by superior marketing skills and greater capital resources. Plessey is able to hold off the challenge of U.S. and Canadian vendors, at least in the first round of such moves.

These developments in hardware all add up to the fact that considerable advances in the price performance of computer systems are realisable and should continue.

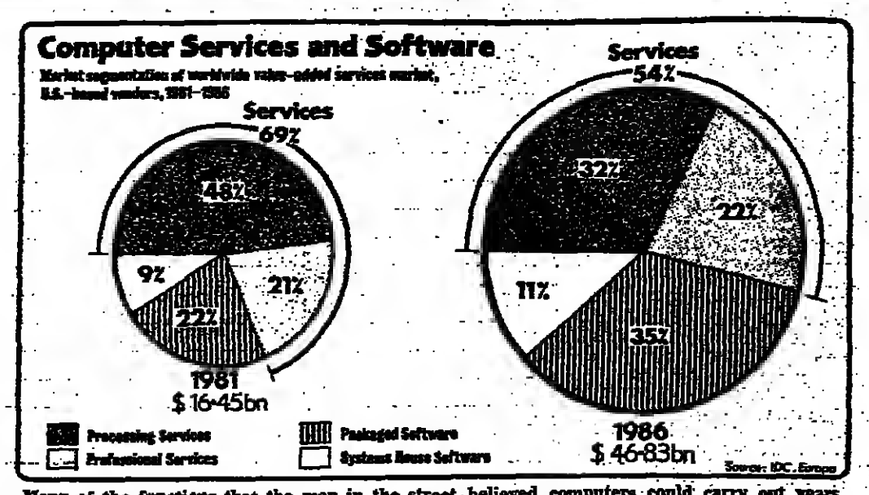
Although ICL does not have e sizeable stake in the world information technology market, it can still achieve price performance increases which provide a good example of how the industry has moved. ICL has been able to achieve a 30 per cent improvement in its ME29 small mainframe over the last two years, due mainly to the falling cost of computer memory and the more powerful generations of chips now available.

While providing these improved products for system vendors to use, the chip industry is looking ahead to the next generation. There seems to be general agreement that a new type of chip called Complementary Metal Oxide Semiconductor (CMOS) will provide what is demanded in the 1980s.

The recent International Solid State Circuits Conference provided a forum for debating which type of CMOS production would provide the right trade off between speed of processing, size and power consumed.

As the chip industry juggles with these parameters, users struggle to get the most out of their system, whatever its size.

Richard Sharpe



Many of the functions that the man in the street believed computers could carry out years ago are only now becoming commonplace through better software. In particular, only now is sophisticated software being written to make microcomputers into true business machines rivalling mainframes an i minis in their power.

Links between machines increase communications

Networks bring useful benefits

MOST BUSINESSES today realise the importance of good communications for the efficient running of their companies.

The telephone has, of course, long been essential. But similarly, computers are increasingly being introduced to operate many aspects of companies' activities, from controlling machinery and production processes to payroll work and accounting. They are also found in the form of word processors, producing letters and documents.

As well as the large central computers, used in payroll and accounting, small personal computers are making their appearance in a host of applications throughout companies. They may, for example, be used by managers to estimate company performance while, elsewhere in the building, a researcher may be running experiments on a different machine.

It becomes increasingly desirable that these smaller machines can link into larger computers, to communicate with each other, to give access to more information or simply to share costly facilities, such as printers, or on discs, on which information can be stored for later use.

It was out of these needs that the local area network (LAN) concept was born. Local area network can be thought of as simply as a ring of cables, rather like the electricity mains in the home to which all the computer and related equipment is connected.

Before the advent of the local area network, a computer would have to be directly connected to other equipment, thus limiting where equipment could be sited around the building. Printers and other peripheral equipment had to be close at hand because so many cables and wires were needed to link them together so it was easier to have short runs of cable. It is difficult to keep track of each cable and there is only a certain amount of run in ducts to accommodate any expansion in the system.

‘A single network could serve an industrial plant, office building or a small research laboratory’

In a local area network, one ring of cable links all the equipment. A single network could serve an industrial plant, office building or a small research laboratory. For much larger applications several rings may be needed, all of which could be connected and controlled by a master ring.

Today, there are many different types of local area network on the market. In principle, they operate by sending packets of data around the ring all with individual addresses. These addresses relate to the equipment which is connected to the cable. So, only the machine with the correct address will receive data addressed to it—all the other equipment on the network will ignore the information as it flows around the ring.

Some of the best-known LANs are Ethernet, developed by Rank Xerox, and the Cambridge Ring, designed by Cambridge University. Several commercial version of this LAN are now on the market, including Polynet VTS, produced by Logica in the UK.

One of the earliest pioneers of local area networks was Datapoint. This U.S.-based small computer and telecommunications group introduced its ARCNET system as early as 1977.

LANs vary in sophistication.

CONTINUED ON NEXT PAGE

COMPUTERS IN BUSINESS XIX

The minicomputer has brought a revolution in software systems and packaging

Message of the little boxes

IT IS INTERESTING to speculate whether the dataprocessing industry would ever have thought of making computers accessible had it not been for the advent of microcomputers. The cheap, highly functional little boxes that flood high street shops have taught the so-called professionals a thing or two about that all important interface between people and machines—not least of which is how to package it.

The jargon term for computer systems which do not rely on a knowledge of jargon, and therefore offer a useful person/machine interface, is "user friendly." Large mainframe computer systems and their immediate successors, minicomputers, were not user friendly. Putting it another way, they were badly designed.

Only since microcomputers have taken computer power out of the laboratory and the computer room, has there been any real concern over making computer systems easy to use.

There are several approaches to improving communications between people and machines and they all ultimately rely on software. Like a camera without film or a car without a driver, a machine without software is useless.

Perhaps the first successful attempt to improve the design of computer systems for mass use was the highly popular Visicalc package which helped so much to make microcomputers appeal to the business person. For the first time a computer could do something which directly related to the person's work and did it in a "language" that real people could understand.

> ‘There are several approaches to improving communications between people and machines and they all ultimately rely on software.’

The success of Visicalc has done a great deal to stimulate experimentation in improving interfaces and the package has been followed by a number of spinoffs from the Visicalc idea of presenting and manipulating information in tabular form.

Ironically, at the other end of the computer spectrum, in the ivory towers of IBM research laboratories, scientists have for several years been experimenting with presenting information in table form. Since one of its researchers, Edgar Codd, put forward the idea in the early 1970s, the relational database, as it is called, has been seen as a possible solution to the interface problem.

Like Visicalc, the relational view of data see everything in terms of rows and columns. It sounds simple and, in fact, it is. The problem comes in implementing the idea in software—an area where the people who built Visicalc scored over IBM. Granted IBM's project is aimed at providing a general-purpose solution to the problems of presenting data to the people so that they might understand its structure, Visicalc was aimed at giving non-programmers a way to use a computer as a combination of pencil notepad and calculator.

Visicalc is only a step on the way, however. It still relies on a typewriter keyboard for input and a straightforward numeric display for output. Far more exciting things are just beginning to emerge which should help to bridge that chasm between the computer system and those who must use it.

The typewriter keyboard predates the invention of computers by half a century and is an anachronistic hangover from a more cumbersome mechanical age. It exerts a tyrannical influence over the way the computer systems are used — not least of which is the precision required to use one.

Building on work initiated by Xerox at its Palo Alto Research Centre in California, Apple Computers has brought a new means of providing input to computer systems with the idea of the "mouse." Its much publicised Lisa system launched earlier this year is yet another example of the micro stretching the boundaries of interfacing beyond the tried and tested methods of keyboard input and numeric output.

It makes using a computer system like playing a video game. By moving the mouse around on your desk you can get an electronic representation of the same to move about on the screen in front of you. In the Lisa system, and the Xerox Star system which preceded it, the tyranny of the keyboard has at last been overcome.

The other side of Lisa is the use of graphics to represent the structure of the task being performed. If the computer user wants to scan through a file of information, for example, the file is shown graphically upon the screen giving a pictorial representation of how the data is organised. By simply pointing at a particular item, the user can bring it forward for processing.

Graphics has already made some considerable impact on the way that data is represented. Instead of showing data in purely numeric form, it can be represented as pictures. These pictures—whether as pie charts, histogram or straightforward graphs—can convey the important part of their message much more quickly.

The other thing about them is that they are inherently "vague." A good analogy is the difference between a digital watch (numeric representation) and an old-fashioned clockwork watch (nowadays referred to as an analogue watch!). The latter provides us with an approximate picture of what the time is very quickly.

The former gives a precise indication of the time but it takes us a while to work out what it means.

Generally speaking the picture is more convenient. We would rather think of it being "about half past ten" rather than 10.31 because half past ten means something to us (nearly time for morning coffee). So, the vague pictures that a graphics system can use to give an indication of value (a rising line indicating increasing sales for example) is far more useful to us than a stack of figures.

This theme of vagueness is also being pursued as a project in its own right.

The London Business School has been working on ways of apply advanced mathematical theories to the job of designing systems. One theory—again emanating from California—is Lofti Zadeh's theory of "fuzzy logic." Zadeh, a cyberneticist, argues that we tend to think of things in vague terms. At LBS attempts have been made to apply this to how managers think about their problems in a long-term project called the Management Learning Project.

Philip Boxer of LBS suggests that user friendliness will only come about as a result of people being able to design their own systems at a very low level.

The LBS project points the way toward systems which are capable of adapting to their users needs. This inevitably means building some sort of intelligence into computer systems.

The field of artificial intelligence has received a great deal of attention since the Japanese announced their intention to go ahead with building a new generation of computers.

> ‘Graphics has already made some considerable impact on the way that data is represented.’

For many years artificial intelligence research has been consigned to the backwaters of the research community. In the early 1970s the government-sponsored Lighthill report concluded that it was not worth pursuing as it had little to offer. The announcement of the Fifth Generation project by the Japanese has given a new boost to the subject, however.

Certainly, some of the ideas put forward by the artificial intelligence community would seem to offer possible solutions to the problem of improving the interface between people and machines.

The area of expert systems (or "knowledge engineering") has received special attention in the Alvey Committee report, now awaiting government ratification.

At present no one is quite sure what these new systems will offer in the way of improved interfacing, but there is a lot of evidence to suggest that a key quality of such systems would be their ability to adapt to their users.

At the same time a great deal of potential lies in these systems' ability to pass on knowledge to people. The example already in existence essentially capturing the knowledge of a human expert inside the machine, include mineral prospecting systems, medical diagnosis and chemical analysis systems.

Some software researchers are talking seriously about applying these systems to the development of software itself. That is probably the expert system we need most of all.

Philip Manchester

Increase in local area networks

CONTINUED FROM PREVIOUS PAGE

For example, Acorn Computers has developed Econet—a cut down version of the Ethernet system. Its idea was to produce a very cheap system which could be used in schools so that microcomputers could share expensive resources. However, it now believes that its system will be of benefit to small companies which also have similar cost restraints.

As the demand for communications between computers grows, so will local area networks becoming increasingly important. Data communications is speeding up and it is not just within a single building that there is a need to link machines.

Eventually, local area networks will be expected to spread over much larger areas than at present, with many miles instead of several hundred feet separating computer users. In computer jargon, networks then become wide area networks, or WANs.

An illustration of the advanced work going on in the field of high speed communications and networks is Project Universe which had its first public demonstration in the UK last month.

Project Universe is a collaboration between government, industry and universities. It is a three-year study to assess the practical problems of linking large computers systems over long distances at high speed.

It brings together the concept of local area networks and high speed satellite links for the first time. The major participants in Project Universe are the Department of Industry, the Science and Engineering Research Council's Rutherford Appleton Laboratory, British Telecom, Cambridge University, University College London, GEC and Logica, and Loughborough University.

Other companies including, Orbis Computers, a subsidiary of Acorn Computers, BICC, Cifer Systems, and Marconi Avionics have also contributed equipment and design work to the project.

Industry is interested in the £4m project because the transmission of high speed digital data between computers over both short and long distances is becoming increasingly important in business, industry and scientific research.

In Project Universe, participants make use of the Cambridge Ring local area network. In this system, packets of data of fixed length travel around the ring in one direction only—some systems send information both ways around the ring. The basic speed of the data from one station on the ring to another is one megabit per second. In a few year's time, data will travel at ten times that speed.

The rings are connected to satellite earth stations so that they can be linked to other local area networks, further away in the system. Project Universe makes use of the experimental Orbit Test Satellite run by the European Space Agency to bounce the information from ring to ring.

> ‘. . . transmission of high speed digital data between computers over both short and long distances is becoming increasingly important. . .’

An important feature of Project Universe is that it is very flexible indeed. It allows any computer devices at any of the main participants' seven sites, spread around the country, to communicate with any other site.

One of the aims of Project Universe is to test the feasibility and economics of this type of communications. Soon telecommunications authorities, such as British Telecom, will offer commercial high-speed links similar to that already used by Project Universe. Certainly, networks open up interesting possibilities for business.

Elaine Williams

Rex Winsbury surveys viewdata developments

IBM keeps the sector guessing

OF THE 24,000 customers of the Prestel viewdata service run by British Telecom, all but about 4,000 are in business rather than at home. Although there are new initiatives to spread Prestel to more domestic users, such as the Club 403 scheme being run around Birmingham, it is noteworthy that there are at least three significant innovations this year in applying Prestel still further to business.

September should see the launch of Business Micronet, the business version of Micronet 800. This initially offers games and other software to home users of computers such as the BBC micro, Apple, Tandy and Commodore.

The scheme has been devised jointly by Telemap, the viewdata subsidiary of East Midlands Allied Press, BT, and Prism Microproducts. The software is held on Prestel and downloaded on request.

Mr Richard Hease, in charge of Micronet, says that Business Micronet will initially offer two facilities. One will enable the home micro to act as a telex terminal, interfacing via Prestel with the standard telex network. It should, he says, appeal to the low-volume telex user.

The other will offer a sophisticated form of electronic mail. The user will be able to compose his electronic letter using word-processing software, dial up Micronet, and send it to the Prestel computer, which will store it until the recipient calls it down to his/her compatible micro.

Mr Hease foresees other applications, such as Medical Micronet, with information about supply of drugs: estate agents use: feed-mix calculations for farmers: and using the micro to call up company information deriving, for example, from the Financial Times.

Essentially, the purpose of the Micronet concept is to harness the home and personal computer, which is often in the larger sizes used for business purposes, to the viewdata network. Micronet users can also take advantage of Homelink the second new business service launched this year.

This is a joint development by the Nottingham Building Society and BT Prestel and offers a range of banking facilities to customers of the Nottingham Society who deposit £10,000. This may later drop to perhaps £4,000, but initially it will be firms of solicitors, accountants, surveyors and other professional practices who are most likely to take advantage of the service.

A complex security procedure should protect the customer against fraud. It would be surprising if other UK financial institutions did not emulate this pioneer in home banking before long.

The third new departure is Prestel CitiService, again a joint venture between British Telecom and a third party,

September should see the launch of Business Micronet, the business version of Micronet 800

this time Intercom Videotex, a subsidiary of Inter Commodities, the commodity brokers. This, say the partners, will offer a range of business information aimed at the clients of City institutions, in the areas of securities, foreign exchange, futures markets, commodities and money markets.

Unlike Homelink and Micronet, there is no exclusivity implied in this venture. The Financial Times, for example, is developing its own foreign exchange information service on Prestel, in addition to its regular business news and other business information. But ICV will have a role in the indexing of financial information on Prestel.

Such developments as these may or may not reverse the trend previously noticeable for business applications of viewdata to migrate to private viewdata systems rather than to the public viewdata service. BT has for a long time been worried about the preponderance of business users on Prestel, on the grounds that almost any business application could be done on a private system, and that Prestel might be being used simply as a temporary testing ground.

Certainly, Britain is almost unique among countries developing viewdata in having a substantial number of private systems in operation for in-company and other dedicated uses.

Such interest is not evident in, for example, West Germany, while the French system is in any case built on the concept of the public viewdata network simply acting as a communications intermediary between the terminal and the remote computer. However, both the French and German systems are at an earlier stage of development than Prestel, which must account for around half the viewdata sets in use in Europe as a whole.

The British motor industry has made use of private viewdata to provide dealers with up-to-date information about stocks and availability.

The most sophisticated private system is probably the Topic service run by the London Stock Exchange. This provides real-time price movements to stockbrokers and financial institutions, and enables brokers to send advice and recommendations in confidence to their particular client list, over the viewdata lines for display on the screen.

One clear way in which Topic has to differ from standard viewdata systems is that the stock prices on the screen are automatically updated before your eyes if a price change is fed into the main computer from the floor of the exchange.

But one move which BT and others will be watching closely is the dabut of IBM in the UK viewdata market. IBM has the contract to set up the German PTT's viewdata network, which initially used Prestel software for its trial period. However, IBM is said to have run into trouble in implementing the contract.

In the UK, however, it does have a computer network with a viewdata capacity that could offer a rival networked service to BT for third parties to use. It recently took on its first public viewdata client—someone who had previously parted company with Prestel. IBM worldwide may or may not have grand ambitions in the viewdata field. As usual, the computer giant is keeping people guessing.

Some possible applications and implications of ISDN

Participant	Interpersonal communication	Man/computer communications	Computer/machine communication
Business users Goverment and public institutions Domestic users	Message store and forward Conference calls Mixed media communications Call redirection Charging information Hotel services Data communications	Point-of-sale Database systems Recorded services Educational programs Videotex Teleshopping	Security systems Facsimile interpretation Media conversion Alarm and monitoring systems for the home Slow-scan TV
Communications suppliers Computer suppliers Terminals suppliers Software suppliers	Telephone codecs Picture 'phones Data terminal PABXs LANs Local storage devices High speed facsimile communications Management software	Specialised VLSIs Mass storage devices Fifth generation adaptive software Micro clubs	Remote process control Automatic information services —searching and selecting
Carriers (circuit providers): PTTs International record carriers Value added carriers Other carriers, eg SBS, Mercury	New market areas for value added services Tariff dilemmas Redirection services Address list codes	Provision of information services	Wired cities International standards Investment in new systems Abolition of private circuits Network management

Terence Westgate on new animals in the telecommunications jungle

Taming the ISDN

TELEPHONE COMPANIES throughout the world intend to introduce new and exciting services based on computer communications technology between now and the end of the century.

Yet although these Integrated Services Digital Networks (ISDNs as they are called) will have a significant effect on the design and use of future communications systems it is already clear:

- The implications are poorly appreciated.
- Standards have yet to be settled.
- There are a variety of ways to interpret ISDNs.

So what are these esoteric new animals in the telecommunications jungle?

All ISDN really implies is that a galaxy of dramatically new services can be provided over the telephone if the system uses entirely digital signalling—the way computers talk to each other.

Of the four principal telecommunications areas—radio, direct satellite, cable television and telephone—satellite and cable TV have received the most publicity. Yet the telephone system can be and is used to communicate voice, facsimile, computer data and viewdata.

Telephone systems are moving from analogue—where the information on the line is represented by a continuously varying electrical current—to digital, where the analogue signal is coded as a series of electrical pulses. Computers and computer-based devices understand these streams of pulses (or "bits") very well and can manipulate them in various ways.

Already most telephone conversations travel digitally for the "long haul"—it is the line between your handset and your local exchange that remains stubbornly analogue.

If the whole system from telephona handset, viewdata television or facsimile machine operates digitally, new electronic exchanges will have to be involved both at the public and the private (PABX) levels. British Telecom's System X is an example of a system which will eventually operate in entirely digital mode.

These sophisticated new exchanges will provide:

1. Very fast call set-up and clear-down times of typically less than one second.
2. Automatic call redirection.
3. Detailed billing.
4. Conference calls.
5. Storage of information.

So a new mix of prodncts and services will be developed with considerable implications for customers, equipment and service providers and for the companies who provide the circuits. (The table sets out some of these possibilities.)

The issue of tariffs is, of course, critical to the nature of product development and the ways in which they will be used. The dramatic reductions in the price of computing over the last 10 years has proposed new approaches to their use in both business and the home.

Local Area Networks (LAN's), which provide high speed digital circuits over limited geographical areas could in theory affect tariff setting in one of two ways:

1. Encourage a high tariff to compensate for the reduced use of the public service.
2. Encourage a low tariff to stimulate use of public services.

The adoption of wholly digital technology at the telephone handset level supports tha

The need for standards has never been more urgent

notion of using the PABX as the centre of an integrated voice/data local network.

Again, the tariff implications are the same. The prospect of low cost computing with mass storage capabilities also suggests that a local group approach to the use of remote data bases and information services could be adopted.

For example, a local computer could access a remote data base, carry out predetermined search routines and store the results locally for access by the local user community. The effect on communication and information services would again be dichotomous.

The ISDN offers, on tha other hand, the prospect of pre-programmed calls, fast set-ups and high speed data transmission, which would make access to remote services more attractive and possible from any telephone point.

To turn potential attractiveness into marketable propositions, however, requires sophisticated software to make the services reliable and attractive to the customer.

There also has to be a general appreciation and understanding of the standards to be adopted by the carriers so that services and users' equipment can be interfaced to the networks.

Further, agreement between carriers must be reached so that systems will be internationally compatible. Study Group XVIII of the CCITT (International Consultative Committee for Telegraph and Telephones), is the group currently considering ISDN standards.

While the situation which faces today's equipment suppliers may be less than clear, tha potential user is faced with the question of investing in systems which carry a certain degree of obsolescence—or at least choosing which type of system offers longer term adaptation to ISDN. This problem of a technical migration strategy has two aspects:

- Equipment—terminals and switches.
- Software and operational routines.

The simple transformation of communications signals into digital streams can make a considerable impact on interpersonal communication systems. The concept of creating a message and having an online holding and forwarding agent to handle tha reply has already created a new market in computer based message systems.

Today, these systems (for example, Telecom Gold) employ only text codes—in the ISDN era we could expect combinations of simultaneous voice and image.

Establishing local systems to interface to forthcoming ISDNs does offer some technical parameters and guidelines.

Establishing the procedural and operational patterns within and between organisations is a longer term, and in today's information economy a more difficult problem to face.

The need for standards has never been more urgent in the world of computers and telecommunications.

In spite of the international work of the CCITT, there are national variations on international themes in standards.

The need for integrating software between systems is a result of divergent approaches; in the UK a programme is underway to develop a junction between different message and text systems, in Canada INet is another approach to the need for a Network Access Machine advocated by Davies and Barber in the 1970s to facilitate man-computer interaction in computer networks.

In the interim period between the present day and the full-scale implementation of ISDN, there will be a number of pilot studies. In the United Kingdom pilot trials will commence at the beginning of 1984 under the auspices of British Telecom.

Before attempting yet another high level evaluation of their technology, however, most organisations would be well advised to review the basic premises of their communications and to consider whether technology can offer any more solutions until tha digital revolution h.. been more thoroughly understood.

With the growing proliferation of low cost digital technology components, the need for a radical approach to total systems requirements and therefore specifications, has never been greater.

"Plus ca change, plus c'est le même chose" has rarely been more apt—for isn't ISDN a return to the all digital signalling of Samuel Morse of the 1840s?

Terence Westgate is a member of the Telematics International Group of consultants which specialises in the design and implementation of computer and communications systems in many parts of the world.

The Big Issues: The survey closes with reviews of developments most likely to influence the industry's future

The battle of the two corporate giants

IT HAS BEEN billed as one of the most important contests ever staged between two corporate superpowers, a battle for supremacy over the fastest-growing markets in the world. Win or lose, the strategies which the two deploy seem certain to have far-reaching consequences for their smaller competitors both in the U.S. and internationally.

American Telephone and Telegraph and International Business Machines, long undisputed champions in their own leagues, are set to compete directly for the first time on the same territory. At stake is mastery of the business of managing, processing and transmitting information, worth, by some estimates, as much as $150bn a year.

Both companies, it should be said at the outset, insist that

‘Both companies have already begun to establish bridgeheads in what was once the other's commercial territory’

they are not gunning for a showdown and argue that head-to-head competition would be pointless and ultimately self-destructive. The question in the minds of many observers, however, is not whether the two sides are deliberately seeking a confrontation but whether, in view of the size and expanding scope of their activities, they can avoid one.

technology and changes in government policy have eliminated the barriers which for many years have separated the tightly-regulated American telecommunications industry from the unregulated business of data processing. Early last year, both AT&T and IBM were also unshackled from the protracted anti-trust proceedings brought against them by the U.S. Justice Department, freeing them to compete on a no-holds-barred basis.

The terms of AT&T's anti-trust settlement allow it to venture for the first time beyond its long-standing telephone monopoly and, as company executives like to say, "follow our technology where it leads us." Increasingly, that technology points towards involvement in activities such as office automation, private information management systems and even process control, where the techniques of computing and communications merge.

In exchange for this new freedom, AT&T has undertaken to divest itself at the start of next year of its interest in the 22 Bell System local telephone companies, which account for about threequarters of its total assets of more than $150bn.

It will retain Bell Telephone Laboratories, its research and development arm, its vast Western Electric manufacturing subsidiary, its long-distance operations and American Bell, which has been formed to develop and market competitive equipment and services to business and residential customers.

The divestiture will reduce AT&T from being, by most measures, the largest privately-owned corporation in the world to merely being one of the largest. From the start of next year, it and IBM will be more or less evenly-matched in terms of size, with assets and annual sales of more than $30bn each.

Both companies have already begun to establish bridgeheads in what was once the other's commercial territory. AT&T is selling Unix, a powerful operating system for minicomputers, and has indicated plans to launch a range of business systems and terminals over the next few months. It has also started to build a national network, AIS/Net 1000, which is intended to carry high-speed communications between the most commonly-used types of computers.

IBM has its own contender in the market which AIS/Net 1000 hopes to penetrate, called Information Network Service (INS). The data processing giant has also been fleshing out its telecommunications product range. It has commissioned Canada's Mitel to develop for it a range of private switching systems and last year launched a facsimile machine which incorporates sub-assemblies supplied by Toshiba of Japan.

In addition, IBM has a one-third share in Satellite Business Systems (SBS), which started commercial operations

‘... the commercial battleground is likely to stretch from the very biggest companies to small businesses and even residential consumers.’

early last year. SBS is an ambitious project to provide a variety of services in the U.S., from direct high-speed data transmission and videoconferencing for large businesses to low-cost inter-city telephone circuits

However much the design and specification of the products and services offered by the two companies may differ in detail, it seems inevitable that both will be competing to a great extent to meet similar needs among the same customers. As the horizons of information technology expand steadily, the commercial battleground is likely to stretch from the very biggest companies to small businesses and even residential consumers.

The two approach that market, however, from clearly different starting points, with contrasting business traditions, structures and resources. IBM is a tightly integrated multinational which earns about half its revenues outside the U.S. and has substantial development, production and marketing facilities in 16 countries.

It looks increasingly to Japan as the source of its main competition. It already has sizeable operations of its own in Japan, where its computer sales are second only to Fujitsu, and probably has better access to information about developments in Japanese technology than any other Western company.

AT&T, on the other hand, has pursued a policy of virtual isolation since it sold off its overseas operations in 1925 to concentrate on its domestic monopoly. By its own admission, it lacks experience in the subtleties of doing business internationally and expects to expand abroad chiefly through partnerships with local companies.

Its first collaboration agreement, a joint venture with the large Dutch Philips group to market public switching systems worldwide, was formally announced earlier this year. But Philips' extensive marketing network is geared primarily to selling consumer goods, and the company has a relatively weak position in European telecommunications markets other than the Netherlands. AT&T may therefore decide to line up other partners as well.

Both AT&T and IBM have vast design and production resources in semiconductors and are the world's two largest manufacturers of electronic components, which they make almost entirely for their own use. AT&T has developed both minicomputers and microprocessor-based systems for its switching equipment, while IBM has designed its own private branch exchanges (PBXs) in the past.

Almost certainly neither company can match the other's best efforts in its particular areas of expertise. IBM's decision to turn to Mitel for its new PBX range is regarded by some as a tacit admission of weakness, while AT&T's computer products to date have been geared to the specialised task of switching, with its enormously high reliability requirements, rather than to general purpose data processing, where ruggedness is less important than flexibility and price.

In terms of product development and manufacturing, AT&T's approach is still coloured by a traditional strong commitment to large-scale systems engineering. Its resources have been focused in the past heavily towards its Bell System network, over whose development AT&T has been able to exercise considerable control, rather than to responding to the rapid and somewhat unpredictable shifts of the competitive market.

Where long production lines are called for, Western Electric's ability to turn out huge volumes at low cost is probably unrivalled in the U.S. But executives at American Bell admit that the life of many products will probably be shorter in the future, and that AT&T must learn to adjust more quickly to changes in customer demand.

IBM is considered by some industry observers to be better fitted to adjusting to variable production runs. The company's manufacturing facilities are also exceptionally efficient, having benefited from a massive investment programme amounting to some $12bn over the past five years to equip them with extensive automation.

By any standard, IBM will be a tough competitor when it comes to marketing. Its aggressive sales methods and extensive customer support are renowned in the industry. It has also assiduously cultivated its reputation as a reliable supplier which gets the job done, even if its products do not always offer the best price performance.

AT&T also has a strong commitment to service, though it has also been accustomed for many years to serving a captive market and has in the past been accused of a mentality which favoured order taking over the hard sell.

AT&T has an immense asset in being a household name which commands immediate recognition among more than 80m telephone subscribers in the U.S. As information technology expands to touch an increasingly wide circle of users, this is likely to be a considerable advantage.

IBM, on the other hand, still excels chiefly in selling to data processing departments in large organisations, though the recent success of its popular personal computer has also shown that it is adept at exploiting newer marketing channels, too.

It is difficult to say with any certainty which of the two giants has the advantage. IBM's experience in highly competitive markets undoubtedly gives it an edge, though the need to preserve the loyalty of its many customers also argues against any sudden or radical change in its product and marketing strategy. AT&T still has to adjust fully to its new environment — a major challenge for an organisation of its size — but in doing so it is also free to experiment with new and unconventional approaches.

In the final analysis, it is almost certainly too early to reach any firm conclusions about which of the two companies will perform most successfully in the future. Indeed, the markets open to them are growing and changing so rapidly that it is still difficult to predict with any precision where the major battlefields will lie. But the rest of the world's industry had better watch out.

Guy de Jonquieres

Senior personnel will need to learn the computer game

Training the executives

WITH THE advent of microcomputers, data processing moved out of the "glass room" and into the office environment. Now, computers are taking another stride into the executive suite. Personal computers designed for managers and professionals, often called "workstations", can increase the productivity of the manager just as word processors and general purpose personal computers have speeded up clerical tasks.

There are, however, several barriers to be overcome before the computer is widely accepted as an executive work tool. The first, and perhaps the biggest, problem is that managers and professionals—be they lawyers, doctors, or administrators — are unaccustomed to the sight of a keyboard on their desks. Many resist the idea of typing anything, regarding it as a task that should be done by their secretarial staff.

This attitude is less prevalent in the U.S. where at least most college graduates will have learnt to type at school, but in Europe the keyboard is a mystery to most managers.

Another difficulty is that computers have been exasperatingly difficult to learn to use. How many managers can afford the time to learn how to use a computer? What is more, how many managers are ready to be seen struggling to learn a new skill?

The latest professional workstations are designed to overcome such prejudices. They are getting much easier to use, and at the same time more powerful.

The major use of computers by professionals is in "decision support". The personal computer can provide the executive with instant access to information either from his corporate data files, or from a growing number of outside computerised data bases. The computer becomes a terminal that can bypass the normal information search systems, saving time and assuring that all relevant data is obtained.

Specialist data bases are multiplying both in the U.S. and Europe. One of the latest such systems to be introduced in the U.S. is to be offered by Mead Corporation, of Dayton, Ohio. Mead will offer a computer-assisted patent search system as an addition to its existing legal research system that contains Federal and state laws and case histories.

All patents issued in the U.S. since 1975 plus the 65,000 or more new patents issued each year will be stored in the system. Lawyers, business executives and patent examiners and engineers will be able to conduct efficient searches from their own offices instead of being required to go to the Patent Office in Washington DC. The data base will provide the full text of each patent.

Other professional data base information systems are aimed at doctors, scientists, stockbrokers and many other professions.

Having obtained, for example, market reports, a company executive can use the computer to help him analyse the data. Using a spread-sheet program,

‘... managers and professionals ... are unaccustomed to the sight of a keyboard on their desks.’

for example, he can play "What if?" games. What if the price of oil drops by $2? How will that affect operating costs? What if the project runs two weeks behind schedule? What if this or that indicator changes? Putting a new number into one column of the program will automatically produce the appropriate changes in the other columns.

Visicorp, one of the leading U.S. suppliers of business software for personal computers, recently introduced a program called Visilink that even cuts out the task of formatting data to fit the spread-sheet program. Visilink can be used to obtain business information from the data resources in Computer Databank — one of the largest such data sources in the world.

Visilink users can chose from a catalogue of datakits containing information on a wide variety of businesses, markets and geographic areas. The data is formatted so that it can be transferred automatically to Visicorp's spread-sheet program called Visicalc.

The chief financial officer of a major corporation might, for example, be assessing the best investment instruments for his short-term cash reserves. He uses Visilink to access the daily money market reporter, which compares individual rates for Treasury Bills, commercial paper and certificates of deposit.

He also has access to the Federal funds rate, the prime rate and the corporate bond rate on the datakit worksheet. Using the computer, he quickly completes calculations to estimate average earnings on loans and the cost of borrowed funds.

Clearly it is quicker and easier to obtain such information using a computer. With less time spent on gathering and "massaging" data, more time can be devoted to focusing on the central issues of a professional's business. Critics suggest, however, that such "decision support" systems in fact confuse rather than enlighten the executive by providing too much data.

In practice, many senior executives of large companies do not use the computer themselves but prefer to have an assistant access the relevant data and come up with an analysis. The executive computer does however open up new sources of information and new opportunities to the managers of small- and medium-sized companies which would not have the resources to do it otherwise.

Personal computers also have some mere attractions for the executive, whether they be strictly for business or for more general use.

Business news services, such as that provided in the U.S. by the Dow Jones company, can provide the executive with an instant clipping service giving all the recent news about a particular company or industry.

The computer can also act as an electronic mail terminal for sending messages to colleagues all over the world, or in the next office. It is also a tool for convenient organisation of personal files; and for those quiet afternoons — it seems that every executive work station comes with a version of the latest computer game.

Louise Kehoe

Steps are at last being taken to remedy the lack of a comprehensive set of international standards

Britain gives a lead in standardisation

FOR YEARS, computer manufacturers have mumbled darkly about the need for standardisation in the industry. Until 1977, very little positive moves were made in this area.

The coming of information technology has made companies realise that lack of standards—which would allow computers and related equipment to communicate with each other easily—is a barrier to the growth of the business market sector.

Since 1977, companies such as ICL and Honeywell in the U.S., in conjunction with the International Standards Organisation (OSI), have been looking at future standards which will make all information technology equipment able to talk to each other.

The concept is called Open Systems Connection. It is analogous to being able to operate an electric kettle in any home in the UK using the same plug. But the implications go much further than this simple concept. Today, computer equipment of different makes can only communicate with each other if they are using the same interconnection rules

Open Systms Interconnection plans for a day when the computer manufacturers take into account the need for communication from the earliest stages of product design.

The UK Government has become acutely aware of the need to design for such standards if the market demands for information technology is to be met and customers are not deterred by buying equipment due to lack of standards.

On March 14 the UK's Department of Industry proposed interim measures for standards called the Intercept strategy, which is aimed at enabling British suppliers and users to introduce Open Systems Interconection without waiting for the full process of international standardisation to be completed.

However, the Government is confident that these proposals will meet the international standards when they are finally agreed.

Work on Open Systems Interconnection has been under way since 1977. The problem of setting standards is immense as it not only involves computers, but also all the equipment which has to be connected to them. This includes taking into account the different uses of computers and related equipment such as in electronic mail, banking systems, facsimile, and all forms of communications.

For years computer manufacturers have deliberately avoided setting common standards because they did not see much benefit in allowing competitors easy access to their market share. Also the industry in the 1960s and 1970s grew so rapidly that companies tended to ignore systems outside their own design.

Now it is recognised by the majority that the growth of the markets in business applications such as information technology will be easier if products can be connected to other types of equipment.

The Industry Department's initiative on standards comes from a recommendation by the Focus committee, set up in 1981 and chaired by Mr John Butcher, under-secretary at the DoI. Manufacturers such as ICL and GEC, major users, British Telecom, research organisations and standard setting bodies, such as the British Standards Institution, are represented on the Focus committee.

The intercept strategy will lay down recommendations for standards in those areas of the technology where the International Standards Organisation—responsible for world standards—is close to a final standard.

The first documents on the Intercept strategy recommendations are likely to be available by the middle of the summer.

The DoI is so keen that companies take up the recommendations that it has reminded manufacturers that financial support can be provided through the Support for Innovation scheme. Under this, grants may be given to companies to assist in the development of new products and processes, as long as they use one or more of the intercept standard recommendations.

Agreement on the final international standards may be some years away though in some areas it is already possible to see which standards are needed, some are already in existence and some need major modification.

The main bodies involved with Open Systems Interconnection and the CCITT (Comite Consultatif International Telegraphique et Telephonique), European Computer Manufacturers' Association (ECMA) and OSI.

It is hoped with OSI to achieve a standard for the structure of software in computer systems, including the definition of software interfaces and protocol which allows any make of computer adhering to the standard to be interlocked in a network with any other make of computer.

Mr John Butcher, under-secretary at the Department of Industry—a strong advocate of standardisation in information technology

A reference model for the standard has now been designed, much of it already agreed to a detailed level. The model calls for the computer to be structured in seven layers. Each layer has its own specific function.

This is a familiar concept which has been adopted by several manufacturers in recent years. However, these computer designs are proprietary so that no other maker's system can be connected to them.

The seven layers of the model are:

1. The physical layer which deals with the connection of the computer to the communication lines.

2. Data link. This layer provides the transfer and control of data over the communications lines.

3. Network layer. This controls the overall communications network and the computer devices connected to the system.

4. Transport layer which controls the flow of traffic to other sites and communicates with the transport layer at these sites. This ensures the accuracy and completeness of information being transmitted.

5. Session layer. Here the conversations between users, authorisation of communications, and synchronising the network is monitored and controlled.

6. Presentation layer. How the information will be coded and presented.

7. Application layer. This provides the interface to the use applications on the computer and common services, such as file transfer and terminal support between different systems.

The benefits to this modular approach is that the user, especially with major systems, is protected from modification due to changes in the network. Modification means expense, the risk of disturbing business activities during system changes.

It will enable users to buy each individual element—from terminals, to computers and modems—from the best and most competitive source. Users can build the system in a more flexible way and take into account new opportunities as they arise without major system changes. Thus, standardisation cannot come too soon if companies are to make the best of information technology.

Elaine Williams

Why several different industries seem on a collision course

Battle over network services

ONE OF the most important, far-reaching and well predicted trends in office automation is the convergence of computer and communications technologies as a result of the growing impact of microelectronics.

This impending convergence has led to the widespread recognition that several rather different industries are moving slowly, but inexorably on a collision course. Telecommunications companies, office equipment manufacturers and suppliers of computer hardware, software and services are beginning to offer products which are at least competitive.

Most major companies in these fields have outlined their strategies for 'office automation' which bear many similarities. Inevitably they involve a mixture of data or information processing, the storage and transmission of messages electronically and general communications.

One of the most obvious points of overlap between the different industries is in network communications. Telecommunications companies see their private (and public) telephone exchanges looking and behaving increasingly like computers. Third generation PABXs (private automatic branch exchanges) not only have computer controls but also switch digital traffic.

Computer companies responding to the growing trend towards distributed dataprocessing have also been making significant advances in their communications hardware and software.

Office equipment suppliers have also been equally quick to realise the need for intercommunicating equipment. They have become the major force behind the development of local area networks, a variety of systems enabling a range of devices to communicate with an office or factory site.

The sophistication of most large communications networks

Major companies have outlined strategies for office automation which bear many similarities

is dependent upon the public telecommunications authority. Most international and local networks in the world are based on analogue telecommunications circuits, where data has to be converted for analogue transmission through modems and speeds can be limited.

Increasingly telecommunications authorities are just beginning to offer high speed digital transmission. In the UK, British Telecom has launched its X-stream services. These include high speed data links at two to eight million bits a second, a packet switched data service and planned satellite digital service.

A private sector competitor, Mercury, is also about to launch a high speed digital service in the UK. Both will be a very important part of network planning in the UK.

The most evident development of networks, combining computing and telecommunications technologies, has been happening within organisations. Two years ago there was a strong move towards the development of local area networks with a variety of products including Xerox's Ethernet and the Cambridge Ring. However, the rapid development of truly digital PABX's has recently strengthened the argument that the internal telephone system in an organisation is the best form of distribution of data for many applications.

The installation of a local area network which needs co-axial cable running from point to point causes considerable extra work. Installation of local area networks has been very limited and largely experimental.

In many applications the fairly limited speed at which data can be sent along a pair of copper wires used for the telephone is sufficient. Only when large amounts of information have to be transmitted at high speed does a high capacity network come into its own.

The importance of communications to computer companies is demonstrated by the growing links being established with traditional telecommunications suppliers. The link which has caused the greatest stir is between IBM, the computer giant, and Mitel, the highly successful Canadian-based telecommunications group.

Other links in the U.S. include Hewlett-Packard and Intecom, Northern Telecom and Rolm; Data General and Rolm and Digital Equipment and Northern Telecom. In the UK the largest indigenous computer manufacturer, ICL, is also offering a large digital PABX made by Mitel.

Jason Crisp

COMPUTERS IN BUSINESS XXIII

Alan Cane reviews a report out today which details how much has to be done before the automated office can become a reality

Slow dawn before the office of tomorrow

AN INDICTMENT of the UK's state of readiness for the coming of the "electronic office" is delivered today in a massive report by three leading office consultancies.

The report, the "Orbit" Study" written principally by Dr Francis Duffy of the architects and space planners DEGW, says criticism is easy: "But in reviewing the state of British office buildings, it is impossible to avoid.

"At the dawn of information technology, we have offices which are totally unprepared for the challenge."

The report points to three principal areas of concern:

- The physical limitations of existing buildings for the amount of new wiring and heat dissipation required.
- Information technology is changing office organisation: existing buildings are not flexible enough to cope with the new demands of ergonomics at the workplace.
- The new needs of office users are not being understood or being fed back quickly enough to the suppliers of buildings and services. The Orbit study gives this warning: "The background to all three sets of problems is increasing uncertainty about whether we have too much or too little office space—in which, of course, so much money and hope is invested—and growing doubts about whether what we *have is in the right place.* Unless one takes an unrealistically optimistic line, it looks as if all offices will have to fight harder to attract tenants and users."

Dr Francis Duffy—architect, partner in DEGW and chief author of the Orbit Study.

> "At the dawn of information technology, we have offices which are totally unprepared for the challenge."

The Orbit project is a multi-client study sponsored by ten clients and undertaken by three consultancies: DEGW, specialising in office architecture and space planning, Ecsys, an office automation consultancy—which used to be part of Nexos, the ill-fated government-funded office equipment group, and Building Use Studies, office design researchers.

The clients represented three distinct industrial groups. First, the suppliers of office space: Greycoat Estates with the Norwich Union, Jones Lang *Wootton, Fletcher King* and the Scottish new towns of Cumbernauld, Glenrothes and Livingston. Second, the constructors: *Bovis, Matthew Hall,* Steelcase Strafor (UK) and Steelcase Inc. Third, the telecommunications and regulatory interests, British Telecom and the Department of Industry.

The Orbit study in two volumes with six appendices, is would not be able to cope with it.

The study emphasises that many existing buildings are in danger of premature obsolescence: "*This is because they* will not be easy to modify in order to cope with the direct and indirect effects of information technology." Deep plan buildings are at greatest risk, it says.

It also says: "Extensive and premature renovation of existing buildings will be expensive but inevitable" and goes on to claim: "The cost of renovating certain types of office buildings to take on information technology may be equal to the cost of constructing new buildings."

From which dramatic assertions it might be assumed that the Orbit study deals with new and esoteric forms of office therefore quite different in its approach and conclusions to the more conventional office automation market research study, such as that of Butler and Cox last year.

These more traditional studies have generally indicated that the development of the automated office would be much slower than manufacturers were predicting; the results of the Orbit study suggest that even if customers were ready and able to instal the most advanced office automation (O/A) equipment tomorrow, their buildings automation yet to emerge from the laboratory. Far from it. The study concludes: "Most of the technology which will have the greatest impact on office design over the next 10 years already exists and is in use by leading edge organisations."

Looking ahead, the study suggests that in 10 years time, one in three office workers could be equipped with electronic workstations.

That is probably a conservative estimate. Companies in the U.S. like Wang (see page V) which use their own office products in their organisations already have a video screen for every office worker in their headquarters.

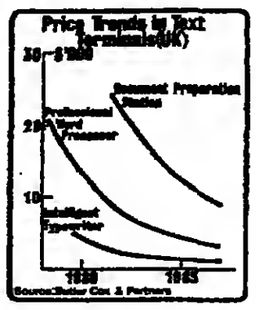
The study also concludes that information technology is not easy to assimilate into office buildings.

The report is brutally realistic about claims that most information technology equipment—computer central processors, printers, storage devices and the like—can operate in general office areas. This is optimistic, it says: "While it may apply to terminals and microprocessors, powerful processors and paper handling equipment still require separation in specially-controlled machine rooms."

The report examines the way that the introduction of information technology changes the manner in which organisations use buildings and the new demands individuals make on their environment.

The average size of an individual workplace can increase by between 50-100 per cent; the demand for ancillary space for private meetings is also increasing: "In some organisations this increase has been at a rate of 25 per cent over two years with the result that only 50 per cent of net usable space in the building is occupied by work places."

So what can be done? The study says the buildings which perform best when information technology equipment is installed have finely zoned air-conditioning systems with add-on capacity, a generous ratio of vertical ducting to floor area, generous and flexible horizontal trunking and the facility to be easily sub-divided for multi-occupation.



The worst performers have their services embedded in the shell so modification is difficult, ceiling height which rules out extra trunking or air-conditioning, shape which reduces space planning options and centrally controlled air-conditioning with poor response to extra and uneven heat loads.

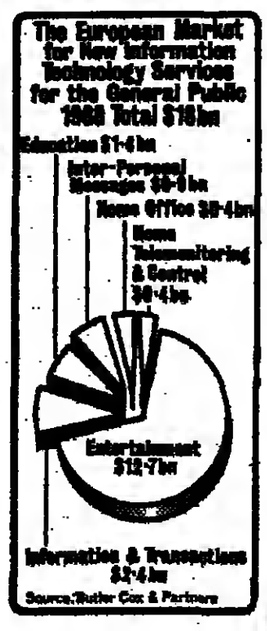
There is a plethora of practical recommendations in the study—for example: "The new stress on services will make large, straight, simple, vertical *ducts (at least 2 per cent of* usable floor area) very attractive. Vertical ducts should be dispersed rather than concentrated and allow for a separation between power, telephone and signal cable."

Recommendations addressed to the intended audience for the report—the suppliers of offices and their equipment—are more pithy.

- For developers and estate agents, the report states, the news is not good: "Some buildings, particularly those of the 1960s, may not be worth renovating unless their location guarantees letting or some extra value can be added to make them more attractive."
- Architects and engineers have to learn the basics of designing for information technology: "Designers in times of change cannot claim to be mere technicians, they must play a part in the forming of future organisations."
- Builders should be able to link renovation with new work designed to provide better access to constructional and servicing elements.
- *Furniture manufacturers will* have to re-think their designs fundamentally: "It is in no one's interest to see expensive furniture components badly used for lack of expertise."
- Equipment manufacturers have to appreciate that many environmental problems related *to information technology* are a consequence of the way the equipment is designed: "Greater user concern for ergonomic issues might force this to the attention of the manufacturer."
- Users have to settle their internal differences to achieve effective space management: "If users are to get the offices they need and not waste their resources changing them to meet new requirements, they must give space planning much more importance and find ways of co-ordinating conflicting internal interests."

> "... powerful processors and paper handling equipment still require separation in specially controlled machine rooms."

*The Orbit Study: Information Technology and Office Design. DEGW 3-9 Bulstrode Place Marylebone Lane. London or Ecsys, Clove House, The Broadway, Fernham Common, Slough; £8,000 including 3 days consultancy.



Systems perform with uncanny accuracy

How expert can a computer become? Alan Cane looks at ways that researchers are endowing machines with 'artificial intelligence'—the ability to make deductions on the basis of stored information

THE YEAR is 1984 and Mr Smith of Winston Smith Associates is at his desk at the beginning of the day. He switches on his workstation and using his keyboard conducts the following dialogue with his personal computer.

Mr Smith: is there anything I need to know today?

Computer: Yes, today is a bad day.

Mr Smith: Give me the bad news.

Computer: Marketing—sales 20 per cent below third quarter projections; advertising costs increase 20 per cent. Finance—working capital down 18 per cent; 20 per cent of currency reserves decline; projected revenues for third quarter down 30 per cent.

Operations—Three month delay in circuit boards; absenteeism increases 8 per cent. Government—HR 32261 passes the House of Representatives.

Expert systems depend upon the most rigorous attention to soft-technology.

Mr Smith goes on to ask the reasons for the turndown in business and asks how sales might be improved.

Computer: Based on historical data and current projections, sales could be improved as follows:

Measures—cut the price of product by 26 per cent.

Projected results—Revenues increase $2m for fourth quarter; earnings fall 10 per cent to $15m.

Side effects—Could create a cash flow shortfall of $1m.

This dialogue, taken from a new report* from the Brattle Research Corporation is an example of a new kind of computer program, the expert or knowledge-based system.

The idea of knowledge-based systems is as old as computing itself; the expert system has become fashionable now because a combination of low-cost but very powerful computer hardware and advances in techniques of artificial intelligence has made possible the first, rudimentary products.

Rudimentary is perhaps too harsh a word. These are immensely sophisticated computer programs developed over many years which perform with uncanny accuracy. But they are rudimentary compared with the artificial intelligence experts' dreams of simple-to-use computer power.

Expert systems are among the first evidence of how successful researchers have been in endowing machines with "artificial intelligence," the ability to store knowledge and to reason and make deductions on the basis of the information stored.

The idea is to provide specialists with the sum of human knowledge in a particular area at their elbow in the shape of a computer terminal with which the specialist can conduct a simple dialogue to unearth the information he or she needs.

The first few systems have dealt with scientific and parascientific specialisms. One of the earliest was "Prospector," an expert system which assesses the suitability of a site for mineral exploitation; another is "Mycin" which diagnoses meningitis and prescribes the most effective drug treatment.

SPL International, a UK software and systems company which has developed its own general purpose expert system "Sage," describes it as a "computer system which reflects the decision-making processes of the human specialist. It embodies organised knowledge concerning a defined area of expertise and frequently operates as a skilful, cost-effective consultant."

SPL points out that Prospector can be used for about $20 an hour compared with the hundreds of thousands of dollars lost in a drilling failure. Trials show that Mycin was more accurate than individual experts.

That Prospect, Mycin, Sage and a few other expert systems can be demonstrated is one proof that "knowledge engineering" is no longer just wishful thinking. There are others.

● Japan has set up an ambitious programme to develop the skills and technologies necessary for "Fifth Generation Computing," a concept that can perhaps best be defined as using reasoning machinery.

● The UK Government responded to the Japanese initiative by setting up a committee under Mr John Alvey, senior Director of Technology for British Telecom. It recommended a five year, £350m programme to develop advanced information technology emphasising: "The programme should cover basic research and design tools in four key enabling technologies, software engineering, very large-scale integrated circuitry, man-machine interfaces and intelligent, knowledge-based systems."

● Perhaps most significant of all, IBM, the U.S. computer giant, has been lecturing on expert systems in the person of Dr Louis Robinson, its director of university relations.

Just as the market for personal computers became "respectable" when IBM launched its own personal offering, so if IBM gives its blessing to experts systems, it is a clear sign that the market is set for growth.

Dr Robinson gave no hint of what kind of products IBM might have on the stocks, or when an IBM expert system might be launched, but there is no doubt from the data IBM has collected on medical and other expert systems that it is taking the idea very seriously.

Expert systems will not be easy to create, especially in the area of executive information support. The Brattle study argues: "Knowledge-based systems are significantly more difficult to develop than current decision support systems."

A decision support system is a set of computer programs which makes it possible for an executive to get information from a large mass of data in a simple and useful form without special computing knowledge.

"They are knowledgeable because relevant knowledge has been programmed into them. There are no tricks here; this takes time and effort. But in addition to having knowledge about things, they have knowledge about what to do with things; this adds another layer of complexity."

The report goes on: "Expertise and knowledge are often difficult to capture and characteristically require an extensive and tedious understanding of a problem or applications area."

What, in fact, distinguishes expert systems from other kinds of decision support computing is that in addition to the mass of information on which the system is based, it also contains sets of rules for dealing with that information. These may be very complex; they deal with linguistics, for example, or they may involve the weightings to be given to separate pieces of evidence in a decision-making sequence.

Most of the early systems have been developed for socially worthwhile purposes—medical systems to aid doctors and to train medical students—but computer manufacturers' interest in these systems is not pure philanthropy.

They see the development of expert systems as a way of continuing to sell computers and to different classes of user than has been the case in the past.

It is possible to predict that within a few years, each executive will have on his or her desk a personal computer, a small, but very powerful machine connected both to the executive's own files and to those of the company he or she works for.

Machines of this kind—the Apple Lisa, the Xerox Star, the Apollo—already exist. What does not yet exist is the means to make these machines simple to use by people who are not computer experts.

Dr Robinson of IBM touches on this point continually in his expert system seminar. The advantages from the point of view of the manufacturer are obvious. The Brattle study points out: "If vendors, such as Xerox, who are stressing user-friendly interfaces do succeed in gaining market share as a result of their Star workstation (it features pictures on the screen to represent common office objects like files and filing drawers) then a major impetus towards expert systems that facilitate usage could develop in much the same way that the market for small business computers did."

It has already generated a new kind of computer specialist, the "knowledge engineer" among whose qualifications are the ability to ask specialists the right questions to get the kind of expert information that has to be fed into the computer's database.

* Artificial Intelligence and Fifth Generation Computer Technologies, Brattle Research Corporation, Boston, Mass., available from Korda and Co. in London at $12,000 (telephone 01-725 8671).

Automation today is often met with little organised resistance, as John Lloyd reports

A radical change in union attitudes

UNIONS "approach" computers in a variety of ways: as representatives of workers whose jobs will change or disappear because of automation; as protectors of members' broader interests, which include privacy, civil rights and health and safety; and as computer users in their own right. Naturally, it is the first of these aspects which has received most attention, and is likely to continue to do so.

Unions have a dual approach to industrial innovation. The creatures of the industrial revolution, they understand well enough the necessity for technical change. As representatives of their members and as possessors of certain sources of leverage on management, they are often conservative because they must reflect the anxieties of their members or because they do not wish to give up the advantages which they have won within the status quo — the classic example is demarcation rights which "protect" jobs by assigning them to one group and denying them to others.

Union "luddism" (it should be remembered that the Luddites were unorganised, one reason for their random and self-defeating violence) is usually directed not so much against new techniques, machinery or systems, as against a shift of advantage to management which the systems bring in.

Little of this was evident in the UK unions' reaction to computers during the first days of their introduction into business and industrial life in the 1950s. The TUC's first "automation debate," in 1956 was prefaced by a statement from the General Council which noted that "the major jobs of trade unions will be to keep automation within the field of industrial relations. Automation can make a substantial contribution to social well-being but there is no automatic transfer scheme to ensure this."

New technology agreements tend now to be confined to office applications.

By 1970, the TUC saw more cause for alarm as a report to it noted that computerisation was taking hold in labour intensive areas: but the report concluded that all technical change ushered in new demands for new products, and hence generated new employment.

A radical change in approach has been apparent in the past five years, as unemployment has begun to climb. While the unions have been careful to place the primary responsibility on monetary policies, they were aware that at the same time as these policies were reducing demand and thus employment, a radical restructuring of work practices was simultaneously taking place in all advanced industrial societies.

The coincidence of these two events has often been fortuitous for company managements, who have been able to innovate and introduce new systems while unions were weakened by unemployment and while recession masked the effects of automation.

Organised labour has also often accepted, often reluctantly once the point has been dramatised with reference to bankruptcy, that labour-saving automation is necessary to render their industries effective with competitors elsewhere — the car industry worldwide being the most obvious case in point.

Thus unions in recent years have regarded automation much less benignly at official level, even while they have often been forced, or persuaded, to accept it without opposition in the plants. In 1980, in the third debate on technology and jobs which had taken place in three consecutive years, the tone was sombre and rather bitter: Bill Whatley, the centrist general secretary of the shopworkers (whose members were seeing automatic stock control and electronic payment systems cut swathes through employment and recruitment) voiced the views of many when he said that the employers were "using the recession as an excuse to avoid discussing with their workpeople the way that new technology should be introduced, the way that benefits should be shared, the protection that needs to be built in.

"I do not want to be over-cynical but I believe that employers are quite deliberately reducing their labour force before new technology is introduced, so that they can say that the job loss is minimal because of the new technology."

The main response from the unions, one which has been in part successful, has been the conclusion of new technology agreements which seek to regulate the introduction and rate of technical change. These tend to be confined to offices; and to be further confined to the health and safety aspects of visual display units: however, some of these agreements include provisions on training, on job security and give the union(s) some say in designing the systems which are being installed.

As unions' powers have weakened under recession, these agreements — which were numerous in 1978-80 — have tended to fall away and where signed, are often very limited indeed in scope.

In manufacturing industry, the increasing automation now being introduced in the automotive sector is rarely the subject of an explicit agreement governing its introduction, but is subsumed within the normal process of collective bargaining on pay and conditions.

Organised labour accepts, often reluctantly, that automation is necessary to keep industry competitive.

The nature of robot introduction at BL and Ford has been such that robots have been introduced on wholly new models, as the BL Metro and the Ford Sierra: the unions therefore had no direct comparison with manning levels before and after robotisation, and thus opposition to their introduction could have proved difficult even had they been in a position to do so.

Unions and the labour movement have at times been active in expressing concern over the issue of privacy — that is, ensuring adequate safeguards on personal information stored in computers. The UK, as the Report of the Committee on Data Protection pointed out, compares badly with other countries on the levels of security it demands, a state of affairs which could lead to commercial problems if other countries refuse to interchange data with the UK.

In one case, at Lucas, unions representing white-collar staff have signed a privacy agreement covering personnel and other records which is probably unique in the country. They did so in part because they were able to persuade the company—a multinational—that it might be in breach of other states' laws if it did not institute the provisions demanded. The Lucas unions may provide an example for other groups to follow, though there has been little sign of this so far.

John Lloyd is joint-author with Ian Benson of "New Technology and Industrial Change," just published by Cogan Page at £12.95p.